UMASS/AMHERST
312066005300612

634.29
G76

LIBRARY
OF THE
MASSACHUSETTS
AGRICULTURAL
COLLEGE
No. 24
SOURCE
SB
388
G73
3-1904
nard

DATE DUE

CARD

MANUAL OF THE VINE.

BY

C. W. GRANT.

634.29
G76

ILLUSTRATED

CATALOGUE OF VINES.

EIGHTH EDITION.

CONTENTS.

PAGE

Account of our Native Grapes in contrast with the European Kinds—Joy manifested in the Vine-Growing Regions at the Approach of the Grape Season—Account of Southern Grapes—Origin of the Isabella—Introduction of the Catawba by Major Adlum—Diana named from Mrs. Diana Crehore, by whom it was produced from Seed of Catawba—Interesting History of the Introduction of the Delaware, by Mr. A. Thomson, of Delaware, Ohio—Origin and Introduction of the Rebecca, ... 3

Importance of the Grape from the Facility with which it may be kept in Winter—Account of the Grapes grown near Paris—Excessive Propagation one of the great Evils to which New Kinds are subjected—The Grape in its best kinds the most estimable of Fruits—The most easily obtainable in abundance, and with the greatest certainty also—All the Wants of the Vine easily supplied, . . 4

Proper Locality and Soil—Preparation of the "Border"—Various Methods—Method of Mr. Mottier immediately after Deep Working of the Ground—As Good Results and as much Enjoyment promised from a Trellis of Iona and Delaware Vines as from a Cold Grapery, at one tenth of the cost, ... 5

Description of Varieties: Catawba, Isabella, Anna, Concord, Delaware, Diana, Allen's Hybrid, Elsinburg, Lenoir, Lincoln, Herbemont, Pauline, Rebecca, Union Village, To Kalon, Hyde's Eliza, Logan, Marion—Remarkable Hardiness, Beauty, and Excellence of the Delaware, . . . 6–11

When are Grapes Ripe? 12

The Conditions of Ripeness—Those that Ripen, and those that do not, ... 13

Time of purchasing Vines, and Method of keeping through Winter—Time of Planting—Age and Choice of Plants, . 14

Planting—Pruning, ... 15

Progress of Taste and Perception of Flavor—Examples of Apples, Pears, and Grapes, foreign and native, . . 16

Training and Pruning, ... 19

Plates Nos. 1, 2, 3, 4, 5, showing different plans of training, ... 20

Description of Plates, ... 21

Thomery Plan, ... 22

Description of Plate, ... 23

To grow opposite Arms, Plates 38, 39, 41, 42, ... 24

Plate 43, with Description—Upright Cordons, with Canes alternate for wall, six feet high—Plate and Description, . 25

General and Special Methods of Planting the Vine—Planting Layers, with Plates 7, 8, ... 26

Shelter and Provision against Drouth, Plates 9, 10, . . 27

To have the Border fully occupied with roots from the plant, Plates Nos. 11, 12, 13—Special Treatment for small Vines—Different Grades of Vines, Plates 14, 15, 16, 17, 18, 19, . 28

Excellent Plan for Vineyard or Garden, Plate 20, . . 29

Planting in Vineyard—To Plant Box Layers, Plates 22, 23, . 30

To Plant for Covering a High Wall, ... 31

Planting at Thomery, ... 32

Repeated Beddings as conducted at Thomery, Plates 24, 25, ... 33

Row of Vines for Thomery Plan, showing appearance at different stages, some as just planted, others having made a shoot of one foot, others at the end of the season, . . 34

Plate 27, showing Method of Shelter; Plate 28, showing Vine brought to the Wall by one Bedding; Plate 29, showing Manner of Planting—Box Layers to be brought to the Wall by one bedding, ... 35

PAGE

Plate 30, Defective Appearance of Vine three years old, showing need of Root-Pruning, and disadvantage of age. . 35

Detail and Explanation of Principal Section of full Thomery Plan, Plate 33, ... 36

Prevalent Idea of Thomery Plan, erroneous, ... 37

Full Thomery Plan explained, Plates 31, 32—Box Layer and Transplanted Vine, ... 37

Method of Shelter without Wall, with Plates showing the Execution in detail, ... 38

Manner of bringing Vines into some system, that have been suffered to grow for years without any, ... 39

Plate 36, an excellent Plan for Garden or Vineyard, with Vine in Full Crop—Plate 37, good Plan for High Trellis in Narrow Yard, ... 40

Preparation of the Soil, and why Depth is very important—Border of proper depth never dry, ... 41

Simplicity of Preparation—Different Methods of Preparation, ... 42

Manner of Performance, ... 43

Preparation by Addition of Soil from another field—Preparation by Aid of Team, ... 44

Different Requirements for Wine and for Table—Training thoroughly treated, exhibiting many plans, from the most simple to the most complicated—Winter Pruning—Summer Pruning, ... 45

Introduction to Training—Training the Vine—No obscurity belonging to the subject, ... 46

The most simple forms, Plates 44, 45—Laterals, Secondary or Anticipative Shoots—Removal of, ... 47

Every thing depends upon Training—Objects, General and Special—Particular Ends to be gained by different Plans—System with two Arms, Plate 47, ... 48

Early Stage of one of the best Vineyard Systems—Method of Pruning, Plates 46, 47, ... 49

Plans 47 and 49 have been, with a little modification, extensively adopted in all Countries—Plan 49 a Constituent of the Thomery System—Importance of proceeding by successive Stages in the Formation of Long Arms, . . . 50

Renewal, Advantages and Disadvantages—Combinations of Stakes and Wires simple and economical—Plate 34 represents a System for the Application of Shelter—Plates 51, 51, and 52 represent the so-called Ohio Bow Plan—Plate 53, Double Bow, ... 51

Description of Plates—Plate 54 represents a good Vineyard Plan in full Bearing, ... 52

Plate 55, Plan for High Walls of Speechley and Clement Hoare—Fan Method, Plate 56—Medoc Vineyard Plan, Plate 57, ... 53

Full Development of the Plan of Clement Hoare, with large Plate representing the Vine in half Bearing, . . . 54

The Method of Bronner, a celebrated German Plan, . . 56

Training Vines on Dwellings and other Buildings, representing them as affording the most advantageous Positions for the Vine; the Vines also adding very greatly to their Comfort and very attractive in Appearance—Three fine Plates, 57

Mildew of the Vine—Preventive and Cure, ... 58

Insects injurious to the Vine, and Remedies, ... 59

Cultivation of Vineyards and Implements for doing at different seasons by Hand and by Horse Power, with engravings, ... 65

Propagation or Multiplication of Stocks, ... 67

How to estimate the quality of Plants—How to keep over Winter, two engravings, ... 68

C. W. GRANT,

IONA, (near Peekskill,) Westchester Co., N. Y.

Entered according to Act of Congress, in the year 1864, by C. W. GRANT, in the Clerk's Office of the District Court of the United States for the Southern District of New-York.

94913

OUR NATIVE GRAPES.

Until recently, from our own hardy native production, we have not been able to realize the aptness and force of those living illustrations in the word of light and life, where the vine is used to give a notion of something more joyous and good than language has yet been rich enough to symbolize. Vines of spontaneous growth are abundant throughout the whole Indian-corn growing region of our country. We have varieties innumerable, many of them so characteristically different, that by botanists they have been considered distinct species, producing fruit which ripens at all periods, from the middle of August to the first of November, and of every hue from amber green (or "white") to intense black. But north of Mason & Dixon's line none of them have given fruit of such excellence as to excite any sympathy with those outbursts of gladness which Pagans and Christians in the vine-growing regions of Europe have always manifested at the approach of the grape season.

At the South, especially in Carolina and Georgia, some very excellent varieties are grown to considerable extent, of which the Herbemont may be taken as a type. This variety had received but little notice until more fully introduced by Mr. N. Herbemont, I believe about the year 1825, who was a zealous pioneer in wine-making. The "Original Herbemont's Madeira," is still growing at Columbus, South-Carolina.

The origin of the Isabella is also claimed for South-Carolina, although no trace of it is now found growing wild. Its introduction marks a long stride in American grape-growing. Wherever it has become established, northern seedlings have, per force of great inferiority, at once disappeared from cultivation, and multitudes, whose tastes were not too nice, have found enjoyment in well-ripened Isabella grapes—some even consider the pungency and aroma of its skin an excellence, while others characterize it as *offensive foxiness.*

About twenty years later the introduction of the Catawba by Major Adlum furnished a grape of much higher character than Isabella, but not able to ripen so far north by nearly a degree of latitude. Both for table and wine, it was a decided step onward. Still something better was desired and earnestly looked for; and twenty years later the announcement of a "*hardy early grape, better than Isabella and Catawba,*" was received with expectant pleasure, and placed the name of Mrs. Diana Crehore among those who will be gratefully remembered.

At about the same time, a "small grape of surpassing beauty and most excellent flavor," attracted the attention of Mr. A. Thomson of Delaware, Ohio, and was exhibited by him at the County Fairs, under the name of the "Heath Grape;" a few years later, after becoming fully assured of its great value, he introduced it to the public under the name of Delaware. But its great excellence proved a hindrance to its dissemination, for it was claimed that no grape of such high excellence could be of American origin.

Mr. Thomson had become intimately acquainted with the characteristics of foreign vines, from those growing in his own house as well as from extensive observation, and never doubted as to the native origin of the Delaware, but was too modest to make strenuous efforts to vindicate his opinions, although he never failed positively to assert his convictions. In consequence of various hindrances and discouragements, he did not vigorously undertake its propagation, and therefore it had little opportunity to make itself generally known as *the* American grape, but in the mean while, its character for beauty and excellence has not deteriorated, and in size of bunch and berry, it has greatly increased as opportunity for development has been afforded.

Two years since, the Rebecca originated by Mrs. E. M. Peake, and introduced by Mr. Brocksbank, of Hudson, New-York, added another to our list of valuable varieties of exceeding beauty and excellence; some even preferring its luscious sweetness to

the rich wine of the Delaware. To Mrs. Peake as well as to Mr. Brocksbank we are specially indebted for preserving and introducing a fruit that is destined to perform so distinguished a part in American pomology.

Of the Anna, I have spoken all that I would say elsewhere, except that I consider it worthy to stand among the six indispensable varieties; and I would further remark that our six best are not inferior to the six best table grapes of France, when we shall grow them with the same skill and care as is there bestowed upon them. We have yet, as a people, much to learn of the importance of the grape, and of the facility with which they may be kept quite through the winter, so that they may, without extraordinary means, be had in good condition for the table from the ripening of the Delaware, which takes place as early as the first of September, to the first of March; so that here as in France it must become the fruit of first consideration, as it is already first in excellence of flavor, and *easily* first in promotion of healthfulness.

In the vicinity of Paris grapes for the table are so extensively grown, and so highly prized, that their cultivation is, *par eminence*, styled "THE GRAND CULTURE;" and that estimation is held in the country in which pears are the most abundantly produced and of the best quality known. The ancient Celtic name, which means "best of trees," expresses the estimation in which it was held by that people; and the name in Greek, Latin, and Spanish, is not less expressive of worth. Of its character with them we know almost nothing, until, after having undergone the improvement of ages, it had reached perfection, so far as varieties are concerned; but the "stock" or constitution of each variety consequent upon the care and skill which it has long received, is regarded as of the utmost importance when a new vineyard is to be planted; for the *immediate produce* from plants well propagated from vines in the best condition is greatly superior to that from vines that have, from deficiency of skill or care, not acquired so great a degree of excellence either in vigor of habit or quality of fruit. Careful observation has shown the great advantage of following this course, and laws analogous to those observed by successful breeders of cattle are not less operative in the vegetable kingdom.

Among the evils to which new and desirable varieties of plants of all kinds are subjected is excessive propagation, either by taking as many layers as the vine can be made to produce, or by using *all* of the wood that can be made to grow; in which cases the vines will always be imperfect or worthless, and consequently the reputation of the variety damaged or destroyed. Of this, the Diana has been a marked example, and those who have experienced its feeble growth, unproductiveness, and small bunches from the dwarfed specimens first sent out, behold with incredulous surprise the exceedingly vigorous growth, which is but its normal development, and such magnificent bunches of fruit as have, this season, been eagerly taken by purchasers from the side of Black Hamburgs at the same price, but with a decided preference for the Diana.

One of our best new varieties is now languishing in reputation in consequence of subjection to this very evil; and the *Delaware* has suffered from it most of all. But the inherent vital energy peculiar to that variety enables it best of all to overcome the injury when again placed in favorable circumstances, if the damage has not been so severe as utterly to destroy its constitution.

It is worthy of consideration, that while the fruit of the vine is the most estimable of all fruits, it is at the same time the most abundant in its yield to cultivation, and our two best varieties (Delaware and Diana) are the least liable of all our vegetative productions to fail of giving a full crop—a *partial* failure even of the Delaware never having occurred, and it appears to succeed in every variety of soil, climate, and locality in which the grape will thrive.

All of the wants of the vine are very easily supplied, and no intricate complication of "specials" is required or advantageous; and the care of it is not irksome to those who lovingly regard it, and make of it a companion through the season. Its rewards are most generous. The place of reception should be fully exposed to the sun at least half of the day, and better if all—not overshadowed by trees, or subjected to the drip of

water from them, and rich pervious soil—such as would yield one hundred bushels of corn to the acre, but made three times as deep, (that is to say, two feet and a half or three feet deep,) with no place for water to lodge at the bottom. About half the depth named will answer very well for a few years, but the vine before it is able to give its best mature results will begin to fail. After shallow planting, profuse manuring is injurious, and there should be no joint occupancy of the ground by weeds or vegetables. Both cause unfruitfullness and unhealthiness of the vines.

Although the wants of the vine are few, simple, and easily supplied, yet they are *imperative*, and, as with all the other fruits of our climate, it is only to judicious care that it *can* yield its richest delight.

Before planting, we must suppose there is a "border," that is to say, a portion of ground, at least three feet in length and breadth, and not less than two, and better if three, feet in depth, of thoroughly mingled fertile soil.

But according to the common acceptation, the word border means length greatly exceeding breadth; for example, twelve feet of width and fifty feet or any indefinite length; for a trellis of vines, more than twelve feet of width is unnecessary, and one third less will answer very well; and it is desirable, but not indispensable, that half of the twelve feet should be prepared before planting. If only a width of three feet is prepared, three feet more should be added the next season. To prepare the border immediately, the unfertile soil that lies beneath must be removed, and fertile soil put in its place. To do this, a trench two feet wide is made to the depth of the mould or fertile soil, which we will suppose to be one foot; if more than that, so much the better. Now, to make the border two feet deep, which is the least admissible, one foot of the subsoil must be removed. If grounds are of considerable size, this may be spread over the surface of a portion, so that it shall not be more than two inches in depth, and plowed or worked in without any immediate damage, but with ultimate benefit, particularly if manure is used at the same time. Into the bottom of this trench the fertile soil of the adjoining two feet is put, and, if it can readily be had, a compost of leaf-mould, or muck, or any vegetable decay, and well-rotten stable manure, thoroughly mixing the mass as it goes in. If sods from a rich pasture can be had, they may be thrown in with the compost to the depth of fourteen or sixteen inches for every foot of subsoil removed, and then the fertile soil from the next two feet put upon the top. Repeat this process until the border of required dimensions is made, and finish by putting into the last trench the soil that was taken from the first. If sods and compost are not used, other fertile soil must be obtained from adjoining ground or some other quarter, to replace the subsoil that has been removed. At the completion of the operation, the ground of the border will be found to be some inches higher than the adjoining ground, but in two years it will settle nearly even. This is the operation called trenching, and without it no garden is in condition for giving best results. For growing strawberries, raspberries, and blackberries, it is equally advantageous, but with this difference, that the fruits last named are expected to continue perhaps only from six to twice six years on the same ground, while vines properly planted and managed have no limit to their duration, and the fruit for many years will constantly improve in quality and earliness of maturity.

NOTE. Vines may be planted according to the method of Mr. Mottier, with equal success, immediately after the deep working of the ground, by using half a bushel of fibrous soil from beaten sods for the reception of the roots, leaving the subsoil to be reduced by the first season's cultivation of the vines.

For vineyard planting the use of half the quantity named may be considered good treatment, the largest portion being put in the bottom of the excavation, but enough above for covering the roots the proper depth.

To those who think the above thorough preparation too troublesome or expensive, I would say, that in soil from fifteen to eighteen inches in depth, having no lodgment of water about the roots, vines will do well for a number of years, and that the Delaware will bear more hardship from ill-treatment than any with which I am acquainted, Concord not excepted. But the system proposed, if fully carried out, promises from a trellis of Delaware and Iona vines as much enjoyment as can be had from the best-managed house, without artificial heat and at a trifling proportion of the cost.

DESCRIPTION OF VARIETIES.

In reading the following descriptions, many will be disappointed at not finding any notice of a great number of kinds that have been highly praised in different quarters. In answer to all on these grounds, it may be said that, in my belief, there is not any grape of even tolerable quality before the public with which I am not acquainted, and that all which are worthy of any attention are herein noticed and described according to their merits. The Isabella and Catawba have heretofore been omitted, under the idea of their being universally known, and descriptions of them, except incidentally in the account of flavor, such as have been given, would be more than superfluous. As the description, however, has been frequently called for, it is here given.

Catawba has large, sufficiently compact bunches, branched or shouldered, with large, globular berries. In color there is great variation, which is not always indicative of quality. The fruit is often pretty sweet and tender while no darker than copper, but when in best condition is dark claret, with some degree of translucency, and when as ripe as possible has but a moderate amount of tough unripeness at the center, with some astringency and pungency of skin, and something of the fox or offensive muskiness. It is spicy, very sugary, vinous, and refreshing. In the latitude of New-York, under ordinary circumstances, it does not attain its best degree of ripeness, or such as will enable it to make wine, although it is distinctively a wine grape, rich, spirited, and refreshing. It rots badly when subjected to a chilling atmosphere or long successions of foggy weather. As a table grape it is generally associated with the Isabella, but is greatly superior to it in richness and vinous refreshment.

Isabella has large shouldered bunches, with large, somewhat oval berries, which begin to blacken early, but advance to ripeness rather slowly. It is less adhesive in its texture than the Catawba, and often nearly loses its toughness almost to the center, but is always without sweetness there. It is at all times greatly deficient in the refreshing property, and is rather feebly flavored, lacking the spirited, vinous property which constitutes the great degree of excellence possessed by *good* grapes. It is always foxy and pungent, its skin making tender mouths sore, and its flavor offending sensitive stomachs. Its peduncles and pedicles are herbaceous, and when subjected to cold become very fragile, and the berries drop with a slight touch. Effervescing wine is made of it, by the addition of sugar, as is done with Catawba also, when sparkling wine is made of that, but it lacks the ability to make good still wine under any circumstances, and is not a wine grape, being deficient in richness.

ANNA.

It is an early and profuse bearer, and the produce of young vines is of very high flavor, but not without a considerable degree of toughness, which diminishes as the vines acquire age and maturity.

It begins to ripen about as early as Diana and considerably before Catawba, but improves by hanging long upon the vines, and is not injured in texture or flavor by severe frost. For late keeping it is remarkable, and its raisins are of unequaled quality.

The bunches are large and loose, or moderately compact on young vines, but on those that are mature, compact, shouldered, and symmetric. Berries large, globular, translucent, and firmly adhering to the pedicels. The color varies from light amber in the sun to pearly white or green in the shade. The bloom is white and abundant, through which may be seen a few brown dots. It is surpassingly sweet, rich, vinous, and somewhat spicy in its flavor, and has a decided but pure and agreeable aroma.

Notwithstanding its exceedingly concentrated flavor, it leaves the mouth cool and healthy.

In habit it is much like Catawba, very healthy and vigorous; leaves very fleshy and firm, remarkably exempt from disposition to mildew, and ripens its wood earlier and more perfectly than any variety with which I am acquainted, and does not lose its leaves until it has matured its fruit.

When tasted by the side of Catawba the latter ceases to be a high-flavored grape.

CONCORD.

This is a very vigorous and healthy grower, and generally bears abundantly. It ripens ten days before the Isabella, and its leaves are much less disposed to mildew and sun-scald than those of that variety. It always retains a large, fibrous, unripened acid center, between which and the skin it is very sweet, but never pure or pleasant, or refreshing in its flavor, and always has a rank odor that is very offensive to most lovers of good grapes. It will have some value as a market fruit from its size, but it lacks that attractive beauty which is indicative of goodness to persons who are acquainted with grapes, and falls badly from the bunch soon after picking, unless it is taken long before ripe. It is only surpassed in hardiness by the Delaware, and ripens at the same time as Diana, but is very far below it in quality, and is unfit for wine.

DELAWARE.

The Delaware Grape has so much more than redeemed its early promises of excellence, and taken its place so far in advance of all others, as our leading variety, suprising even its warmest friends by its vigorous habit as well as by the quality and beauty of its fruit, that remarks concerning it would be quite superfluous, if wrong notions had not gone forth, winged with authority to carry them wherever the character of the vine would be expected to find its reputation. It has been said to be unproductive. This the vine itself has every where disproved. Even the most dwarfed specimens that excessive tenacity of propagation has ever sent out, have not failed to give early and abundant specimens of fruit, but, like the vines, dwarfed and imperfect. It has also been called a feeble grower, and the apparent evidence of it is too frequently met with, sometimes caused by want of care in the purchaser, and oftener by the bad quality of the plant, chargeable justly to the propagator, and sometimes perhaps a small plant has been purchased because it was preferable to none, which has been frequently the alternative, in consequence of scarcity of vines.

I state a fact that is easily demonstrable in the grounds of my neighbors, as well as in my own, that with this variety feeble growth is but an *accident*, and a uniform, vigorous, healthy growth under favorable circumstances the *universal law*. Vines one year old at planting (of my own growing) have, the second year, when only three shoots have been suffered to grow, given an average of sixteen feet, and when from twelve to twenty shoots are grown, the range is from six to twelve feet of strong, short-jointed wood This is but the ordinary healthy growth of the vine—shoots of twenty-three feet and upwards, and measuring two inches in circumference, are in sight from my table as I am now writing. They are grown in rather pervious soil, of only fair fertility, and worked three feet deep. I would here remark for those not fully indoctrinated, that the deep working is not for the purpose of obtaining a rampant growth. That can be more easily obtained by watering with liquid manure on ground that has been worked to the depth of only one foot, and profusely enriched. But this produces a forced and unhealthy growth, and thereby forces upon the plant, or renders it obnoxious to, all those ills that work so disastrously, but which are not the proper inheritance of the vine. The evenly sustained growth on which full development depends, and, through it, the best results in fruit, can only be obtained, where each day's work throughout the season is fully and symmetrically done up. On ground thus deeply worked, vines know nothing of excessive moisture or drouth, and at the end of the season are ready to *enjoy* rather than suffer from the winter's rest, without which there can be no fruitfulness.

The Delaware grape, as first seen by Mr. Thomson, had been long suffering from entire neglect, and the transforming influence of judicious attention has wrought a much greater change apparently in the *fruit* than in the habit of the vine. It has greatly improved in flavor, (rather, its normal characteristics are more fully developed,) ripens much earlier, and has at least three-folded in size, so that instead of "small," it must now be described as medium in size of bunch and berry, and ripening *fully* three weeks before the Isabella.

Its compact, symmetric bunches, of convenient size, fine wine color, and translucency constitute a grape of exceeding beauty, which as an ornament for the table is unequalled

It is very juicy, and its juice is wine—rich, sugary, and spicy, with a fine delicate aroma, suggestive of the Red Frontignac, and surpassing that excellent variety in its brisk, pure, vinous flavor.

Professor Waring has well characterized it: "Those Delaware grapes, which I received from you gave a thrill of exquisite delight, such as I never before experienced from any fruit. Its juice has all of the generous exhilaration of wine—is perfectly satisfying to the palate, and not in the least cloying. We are impatient to be able to gather the fruit abundantly, and were exceedingly disappointed at not being able to get the vines as soon as we had expected."

Mr. Charles Downing, speaking of it, says: "Although the Delaware was highly prized and warmly commended by me from my first acquaintance with it, I have until recently maintained preference for my old favorite, the sweet, luscious Black Hamburg But to the pure, rich, sugary wine of the Delaware, as it now grows with us, I must concede my preference. It constantly grows upon my liking, and when I consider all its excellences, regarding its fine, healthy, vigorous habit, as well as quality of fruit, I can scarcely speak of it in measured terms of praise."

DIANA.

This was grown from seed, by Mrs. Diana Crehore, of Milton Hill, near Boston, and brought to general notice by *Hovey's Magazine* in 1844.

In consequence of the excellence of its fruit, and the earliness of ripening, the vines immediately brought extremely high prices; but from bad propagation the plants became enfeebled, and it soon acquired the damaging reputation of being very feeble in growth, which is directly the reverse of its true character. It is more vigorous, and especially while young, than its parent the Catawba, and requires the same care to have no more canes grow in any given space than will find full accommodation, which should be provided for by pruning and disbudding early in the season.

On well-prepared ground it will make shoots of 15 to 20 feet in length the second season after planting. All of its leaves should have full exposure to the sun. This is indispensable for its present and future health; and towards the last of August its shoots should be stopped, to induce early ripening of the wood. It should also be remembered that it is greatly disposed to over-bear while young, and heroic firmness exercised in thinning. It is able richly to repay all the cost that its proper treatment requires. In the pure high character of its flavor it is only second to the Delaware, and will be most satisfactorily enjoyed by those who delight in the vinous sweetness of the red Constantia. To those who find enjoyment in the pungency of the skins of the Isabella, it lacks an element of pleasure. Although it is in excellent eating condition very early, it hangs very late on the vines, even enduring severe frost without damage, and for late keeping it is scarcely equalled. It readily dries, and become a rich *winey* raisin.

The Diana is constantly and surely gaining in reputation as its merits, habits, and requirements become known.

It bears so early and so profusely while it is young and immature, that its first produce does not mature early, and exhibits but little of the excellence that belongs to more mature vines at the age of four or five years. At this age, if under favorable conditions of cultivation, the vines may be suffered to bear pretty heavy crops, which will ripen early, with flavor pure, exceedingly sugary, vinous, spicy, and refreshing.

But the full degree of excellence in flavor and earliness in ripening must not be expected in less than eight years from the time of planting, which is not more than is required by Catawba and Isabella. At that age, under equal cultivation, the Diana is so greatly superior even to Catawba as to scarcely admit of comparison for the table, and is greatly superior to it for wine also.

Shallow preparation of the ground and excessive enrichment cause a soft, unsubstantial growth of wood, and render the crops small and inferior, and the ripening imperfect or uncertain.

Its habit of growth is very vigorous while young, but with pretty short joints and abundant foliage. When established in bearing, its joints become exceedingly close

ALLEN'S HYBRID.

This remarkable seedling was raised by Mr. J. Fiske Allen, of Salem, Mass., and first demonstrated the possibility of crossing our native vine with foreign varieties. The seed was grown on Isabella and fertilized by the Chasselas probably, as that was one of the three used by Mr. Allen. The leaf is very peculiar, and strongly confirmative of the reality of Mr. Allen's operation, exhibiting the characteristics of both parents, but with a hardiness that greatly excels either. It is a vigorous grower, and appears to be an early and prolific bearer—a vine of two years' age giving specimens. It ripens early or considerably before the Isabella. Its color is light amber-green or nearly white, translucent and very beautiful—bunches and berries of good size. It has a very rich, sugary, vinous flavor, with a delicate Muscat aroma. In quality it is best, and will satisfy those who delight in the Chasselas or the Frontignans. North of New-York it will be advantageous to lay it down in winter.

ELSINGBURG.

But little is known as to the origin of this excellent variety more than that it is said to have come from Salem County, New-Jersey. It has not been extensively disseminated, although known and highly esteemed by lovers of fine fruit in Newburgh and vicinity for about twenty years. It has been uniformly hardy, healthy, and sufficiently, but not excessively productive. Like Lenoir, which it most nearly resembles it can always be relied upon for a good crop, but does not exhibit the full measure of its excellence in quality, productiveness, or size, until the vines have become well established. Size of bunches large, long—often very long—irregularly shouldered. Berries in color black, or very dark, small—skin extremely thin, closely adhering to the flesh, and like the best foreign varieties, it has no acidity or toughness in its center, and in pure, rich, sugary, vinous, *spicy* flavor, it is not surpassed, being without a trace of the "fox." For the garden, it is one of the best. Ripening one week earlier than Isabella, and having foliage in abundance, that is much more substantial and enduring, it is more constant in its character. A standard variety, not to be displaced.

LENOIR.

This excellent variety has been well known and highly esteemed at the South for many years, but little known at the North; the Herbemont having been constantly sent from Cincinnati for this variety for several years, induced the general belief that the two were identical.

But the investigations of the past four years have not only shown that they are two distinct varieties, but, also, that the Lenoir differs from the Herbemont in very important characteristics.

The Lenoir is fully three weeks earlier in ripening, is much more sugary in flavor, and able to endure much greater severity of cold in winter. It has not the excessive productiveness of the Herbemont, but never fails of giving good crops of most excellent and perfect fruit. It has no acidity or imperfect ripeness at its center, and both for table and wine is second only to the Delaware. It has shown itself hardy and early in New-England, where it was received many years since, but not disseminated.

LINCOLN.

This variety for a time lost its identity in confusion among a great many names, but was at length by the Pomologists of Georgia declared to be no other than the Lenoir, changed in consequence of location and culture; but more accurate observation has shown them to be quite distinct. As we have them at the North, they are easily distinguished by their leaves, those of the Lincoln being nearly round and those of the Lenoir deeply lobed. Both have nearly the same rich, spicy, vinous flavor, much more sugary than the Herbemont, which is of the same excellent family. Lincoln is a little earlier as well as more productive than the Lenoir, and equally certain in its crops.

HERBEMONT.

THIS as an ornamental vine has no equal, and in vigor of growth it greatly surpasses all others, and the young vines do not mature their wood early, consequently they must be laid down in winter, until the vine has attained the age of three or four years. Before the first of September the shoots should be "stopped," to hasten the ripening of the wood. It starts and flowers very late in the spring, and never fails to set its fruit perfectly, or loses it by late frosts.

In open vineyard on wire-trellis, it does admirably with me, (forty-six miles north of New-York,) and at Newburgh, fourteen miles further north, on the south side of a house, but never receiving any protection in winter; it always ripens most profuse crops of its most delicious *winey* fruit. Its berries are well represented as *bags* of *wine*, having no fibre and scarcely any flesh in them. It is very sweet, vinous, sprightly, aromatic, (spicy,) but almost without perfume.

It leaves the mouth and lips pure, cool, and healthy, and satisfies the palate with its richness. Its only demerit is in the moderate size of its berries, which are generally about half an inch in diameter. Bunches very large and handsome, being doubly shouldered, color very dark blue, and sometimes violet. (See *Revised Edition of Downing's Fruits.*)

PAULINE.

Formerly received from Georgia under the name of Burgundy, and known as Georgia Burgundy. The following is its description by A. De Caradeuc, of South Carolina:

"Berries reddish-brown, transparent, juicy, very sweet, with very thin skin, about the size of Warren, (Herbemont.) Bunches mostly loose, sometimes compact, shouldered, and large. A most delicious table grape—never rots. In dry weather, if suffered to remain on the vine will wither and dry into raisins. Leaves large, round, dented, curved at the edges, yellowish-green, the ends of the young branches having a peculiar brownish appearance. Buds very prominent. Evidently of American origin, and not European, as its former name would imply. This grape is able to rank as No. 1 for the table, being equal in flavor and delicacy to any European variety. The wine made from it is delicious, and will keep sound for a long time after the bottle is opened and half-used. A moderate bearer."

It is earlier than Herbemont, but its hardiness is not fully tested, and may need to be laid down in winter north of New-York.

REBECCA.

THIS new variety, by its beauty and excellence, has gained a place among our best grapes, and is by some even placed first in rank as a garden variety.

"Bunches nearly cylindric, about four inches long by two in diameter; very compact and heavy; often shouldered. Berries of full medium size, oval and generally much compressed; strongly adhering to the peduncle; color, light green in the shade, auburn or golden in the sun, and covered with a light bloom. The fruit is considerably transculent. Flesh of some consistence, sweet, juicy, and delicious, with a perceptible native perfume, but pure and very agreeable. It has no toughness or acidity in its pulp or flesh, and ripens eight or ten days earlier than Isabella. Hangs well on the vines, and keeps long after being gathered. This superior hardy white grape is undoubtedly a native, and grew from seed in the garden of E. M. Peake, at Hudson, New-York; where it has been growing about ten years, and there proves quite hardy as well as productive. It is not so vigorous in its habit as Isabella and Catawba, but is healthy and not disposed to mildew, and being exceedingly beautiful, as well as excellent, must be considered a very great acquisition."—*Downing's Fruits. Revised Edition.*

UNION VILLAGE.

This variety, by the excellent quality of its fruit, early bearing, and remarkable productiveness, as well as by its size and beauty, has more than established its first reputation. It is gigantic in all its proportions, giving shoots of greater diameter and little less length than the Herbemont, and leaves larger than any other variety. Its bunches and berries are both very large, equaling in size well-grown Black Hamburghs. In quality it considerably resembles the Isabella, but is thought superior to it, and ripens nearly a week earlier. With age, and when well established, the vine becomes very hardy, but while young it has sometimes suffered from the severity of northern winters, so that safety has required it to be laid down. With me, unprotected, it has never suffered from freezing. While young, it is disposed to grow very late—it should have all of its shoots stopped the last of August, or first of September.

TO KALON.

This grape presents a most beautiful appearance, and in favorable seasons is of rare excellence, bearing heavy crops, and ripening early, or one week before Isabella. In unfavorable seasons it often fails to set well, and its peduncles are sometimes affected by mildew, and drop the fruit.

It is a very vigorous grower, with very large and abundant foliage, for which sufficient room should be provided to prevent their early falling.

Bunches large and shouldered. Berries very large, varying greatly in form. Color dark purplish-blue, profusely covered with bloom. It is exceedingly sweet and luscious, with delicate aroma, and when well ripened is nearly or quite without toughness or acidity in its center.

YORK MADEIRA.

This is early, hardy, and when fully ripe very sweet and somewhat vinous. There are two or three sub varieties of larger size, but greatly inferior quality to that which I have somewhat extensively disseminated under that name, and of which Canby's August appears to be a synonym. From an investigation made by Mr. C. Downing, which appears to be reliable, Hyde's Eliza is distinct, but no data are furnished for description, and within my knowledge no plants of it have been disseminated.

The Logan is a black grape of medium size, and bears a strong resemblance, in general character and appearance, to the Marion, which also was found in that part of Ohio. It has a brisk vinous flavor, and ripens early, but in quality, by most tastes, would be placed below Isabella. The Marion also deserves notice for its earliness, in which it is not surpassed by any variety of tolerable quality, and has also been used with some success in wine-making. I have discontinued propagating any plants of it for sale, because, by the side of Diana and Delaware, it appeared scarcely worthy of attention, and wherever those are known it will not be desired unless to complete an extensive collection.

WHEN ARE GRAPES RIPE?

Or, rather, what are the conditions that constitute ripeness?

In all fruits that become excellent and refreshing when ripe, there is found, before ripening, a large proportion of *malic acid*, accompanied by certain conditions that render immature fruit both unpleasant and unwholesome.

All grapes, native and foreign, follow this rule; but in native grapes, with a few remarkable exceptions that will be noted, there are other conditions attending their unripe or partially ripened state, of very marked and peculiar character.

The obviously distinctive characteristics of our native grapes, with the exceptions noted, are of two classes; the first existing in the skin, and the second in the body of the berry. Before the commencement of the ripening process, the skin is acid to the taste, with a pungent acridity, and the mass contained in it is also sharply acid, with a peculiar astringency.

The dark kinds become so deeply colored as to be called ripe long before any

part of the berry becomes eatable, and the change toward the eatable condition, or ripening, begins by the softening of the portion near the skin, toward which the process tends outwardly, involving the skin, as well as inwardly toward the center. The skin is as much in need of thorough change by ripening as the mass that it incloses, and contributes essentially to the excellence of the fruit.

If we were now able to say, "When the portion which the skin is to yield has become elaborated to pure, spicy, animating flavor, and the interior, quite to the center, has become juicy, rich, sugary, and vinous, the conditions of ripeness are fulfilled," the question would be simply and fully answered.

In the best foreign kinds this is precisely what takes place. The skin is very thin, and, as ripening is perfected, it becomes scarcely more than a transparent epidermis, almost without odor and flavor, or pleasantly fragrant and aromatic, as in the Muscatelle class, but entirely void of pungency or ability to give a sensation to the lips. The flesh becomes uniformly tender and of equal flavor throughout at the same time, with just enough consistence to remain a mass together, ready, after the skin is opened, to yield to the slightest pressure of the tongue until all melts to juice. These kinds, although fully ripe, do not lose their hold, but remain firmly attached to their pedicels, and the berries tear in the act of separation from the stalk.

The state of ripeness is indicated by the "*clearing*" of the berries, that is, becoming transparent. Very soon after becoming transparent, the fruit will be found to have become tender, with a sufficiency of sugar and the full measure of refreshing sprightliness, when it is in most agreeable condition for the table. For the production of spirituous wines, it is suffered to hang longer, by which it acquires more sugar, but with some loss of sprightliness if the wood ripens and the leaves begin to fall while the fruit hangs.

But in regard to our native kinds, the case is very different, especially the wild grapes of the woods, and such cultivated kinds as *Hartford Prolific*, *Concord*, *Isabella*, and *Catawba*. As already stated, the process with these begins near the circumference, tending each way, toward the skin and toward the center, but never reaching either so as to bring the fruit to an unobjectionable condition. The *degree* of ripeness which they are able to reach varies greatly, according to the character of the kinds, and as circumstances may be favorable or otherwise.

If we take the *Delaware*, it may be said to arrive so near perfection, on mature vines, that the deficiency is practically of no moment. The flesh can not strictly be said to become *tender and melting quite* to the center, but it becomes *sweet* to the center, and so little fiber remains, that few even of the most critical make any objection on this point. The same may be said of the *Diana*, but with a difference in regard to the skin. That of the Delaware is thin on young or imperfect vines, and *extremely* thin when in best condition; while on young vines the skin of the Diana is very thick. On mature vines, under good treatment, the skin of the Diana becomes elaborated into fine, rich, spicy flavor, pure and most excellent. It becomes perfected as near to the center as the Delaware, but has more of the meaty structure that adapts it specially for late keeping.

The *Israella* begins near the circumference and reaches the center perfectly, but not always with uniformity of structure, the flesh being melting as well as sweet, but on young vines slightly more meaty at the center. This is the only one that ripens from the circumference quite to the center, and still maintains a firm hold upon the peduncle, and also preserves its interior structure unbroken. There is an important distinction between *ripening* to the center and merely becoming *tender* to the center. Some of the early kinds attain through a portion of the berry a considerable store of sugar and some degree of vinous animation, and this so early in the season as to appear to give promise of perfect ripening. But after having reached a certain point, no more sugar is formed, and the vital communication between the berries and the vine is lost, and at the same time the adhering strength of the berries to the stalks becomes greatly weakened or fails altogether. Up to this time a considerable portion has remained fibrous, tough, and acid. After this, the toughness and acidity become less, but at the

same time the *fruity* or ripe portion loses something of its spirit and proportion of sugar. The center has become tender, not from the healthful process of ripening, but from the breaking down of decay, by which it becomes mingled with the better portion, greatly to its detriment in spirit and flavor.

The Northern Muscadine may serve for an example. As the ripening begins, a small portion acquires some degree of sweetness; but as it progresses, the attachment of the ripened portion fails, until the berries of the upper portion of the bunch drop from their own weight. The interior soon becomes sufficiently tender, but loses the little animating spirit that it possessed in its best condition. The destructive process in the berries begins soon after the commencement of ripening, and overtakes and arrests it. And the ripening of the bunches also begins with the destructive process close at hand, loosening the berries from the stalks as both proceed. In such cases the term "perfectly ripe" can not be applied. The Hartford Prolific and Concord are examples, somewhat less marked in this particular, and the Union Village, Isabella, and York Madeira, still less.

The Union Village becomes often sufficiently tender quite to the center, but never spirited and rich, and the large mass at the center that becomes "buttery" by the breaking down of the coherence by incipient decay, soon diffuses itself through the portion that before was somewhat spirited and sweet, rendering the whole flavorless and unrefreshing. The same conditions take place in regard to all of the others named, and the same may be said of the Hybrids (so called) of Messrs. Rogers. None of them are ever spirited and refreshing, or restorative and animating; but in order to obtain the most refreshment from them, the opportunity must be sought to find the sugary portion at its greatest degree of development, while the central portion remains so firm that it may be quickly swallowed in a coherent mass of acidity without mixing with or diluting the better portion. Those may, therefore, be said to have a point of maturity or best eating condition, but no point of ripeness.

In direct contrast to these, we may instance the Elsingburg, which is a grape of the richest and purest flavor, ripening perfectly and uniformly from circumference to center, and when ripe it does not lose its spirit by decay, having but a small proportion of *cellulose* or the destroying principle in its structure.

At the first period of ripening we find it sugary, but not spicy or animating, and impure; but at its last or mature stage it becomes pure, rich, animating, and spicy, and the skin, having lost all of its offensiveness, becomes very pleasant to eat. The Diana can not be said strictly to reach the point of perfect ripeness; for the seeds, which are generally few and small, are always surrounded by a little portion of flesh that is coherent, though sweet and good.

Allen's Hybrid reaches the point of perfect ripeness, both at the skin and center, without a grain of allowance. The skin has no unpleasant flavor, and the seeds, not being surrounded with any toughness or acidity, are easily disposed of in eating.

The *Iona* also fulfills the conditions of perfect ripeness, becoming as sweet, spirited and melting at the center as at any other part, and ripening there so early, that it may be said to begin at the center, although the process goes on so uniformly through the berry, that it is difficult to say which portion is in advance.

This subject has hitherto received very little attention, but it must hereafter be one of the principal points to be considered in the quality of grapes; for upon perfect ripening, conjoined with purity, richness, and animation of flavor, their value as a fruit will depend. When possessed of these qualities in a high degree, the grape deservedly ranks as the best of fruits, and tastes are rapidly being cultivated to a just appreciation of its excellence. The great defects which were formerly tolerated, because they were thought to be inseparable from the native grape, have no place in the new kinds; and the work of demonstrating this to our people, when once well undertaken, will be so near accomplishment, that it may be regarded as done, and grapes which, in addition to other great defects, have that of inability to ripen perfectly, will not long hold rank among fruits.

PROGRESS OF TASTE OR OF THE PERCEPTION OF FLAVOR.

The power to discriminate accurately in regard to flavor, is not altogether a native gift, but is progressive under proper culture, and if we know upon what a person has exercised his taste, we can, without trial, say with a considerable degree of certainty what will be his opinion in regard to certain flavors.

A person who has only eaten the tough acerb kinds of cider apples, on being presented with the Duchess of Oldenburg Gravenstein and Red Astrachan, would pronounce them very tender and agreeable — delightful, and such they are truly in comparison with the others, and able to afford some measure of the enjoyment that belongs to good dessert apples. The same person on being presented with the Dominie would pronounce that delightful and excellent for its juicy tenderness.

Now introduce him to the Vandervere, and on critical examination he would say: "This is by far the best of all apples; tender, juicy, rich, and most delightfully flavored."

After becoming thoroughly acquainted with all of these, by habitual use, for two or three seasons, he would still rank them in the order named, and would find the measure of his enjoyment increasing by their use, but the cultivation would have increased his gustatory perceptions, so that he would be sensible of new wants not fully satisfied by any of these. The Oldenburg, Astrachan and Gravenstein by the side of Vandervere, would be greatly deficient in richness, as well as in tenderness of flesh, and Dominie too feeble-flavored to use when the others were to be had. The Vandervere would be to him still very rich and tender, but he would recur to it more for the sensuous delight of its exquisite flavor, than for its vinous refreshment. His perceptions would be awakened, ready to perceive the true excellence of the best apples, if presented, and to analyze the flavor.

The Early Joe would be to him now most exquisite in its tenderness, purity of juice, and fine, refreshing flavor, and he would not hesitate to proclaim it the best and most delightful of apples. Only the Vandervere would be retained from all the others, as really excellent and very valuable for occasional use, but not for constant use, and not more than once daily, as would be the case with Early Joe.

Now let him make the acquaintance of Northern Spy, in the full spirited excellence of its best condition, and he will say it is almost as tender and delicate as Early Joe, but surpassing it in its wine-like refreshing power. "This is the perfection of apple and the best of fruits for daily use." He can not now go back for enjoyment to inferior kinds.

The person who eats the Windsor Pear will occasionally recur to it again, if he is not conversant with better fruits, and will obtain some enjoyment from it. The Madeleine, although acid and austere, has more spirit, and he will say it is better, but it will not make any impression to be remembered by its decided excellence. The Summer Doyenne will strike at once by its beauty and corresponding sweetness of flavor, but having only a moderate share of vinous life, with a tolerable share of pear flavor, a few, and at not very frequent intervals, will satisfy the appetite for it, and he will call it good, but feeble-flavored, and wanting in wine, for he will have learned to call the refreshing and restorative principle of the apple by that expressive name for which he can find no other, and he will also apply it to the same principle in pears.

He will find the Bartlett better, but if his perceptions are acute, its defects will also be apparent, and he will not characterize it as excellent without reservation, although he will say it is rich in sugar and wine in comparison with the others.

If the Rostiezer now is offered, he will perceive in its rich mingling of sugar, wine, and spice only an assemblage of goodness, leaving nothing to be desired that may be looked for in a pear. He will be very sensible of the defects of the Bartlett.

The Seckel, richest, most spirited and spicy of all sugary pears, he will not find more satisfactory and refreshing for daily use than the Rostiezer, and he will probably characterize the Rostiezer as the best for abundant family use.

Above these, there is one more rich, winey, and refreshing, but it is so rarely obtained in perfection, that few have an accurate knowledge of its character. That is the Beurre d'Aremberg, and in its vinous spirit it makes a nearer approach to spirited grapes than any other fruit. He now appreciates the good and ceases to value the inferior kinds.

If a person has eaten none but common wild grapes, or ultra natives of the rudest kind; on trying the best Concords he will pronounce them good, and if he has eaten only Isabellas that have grown so far north that they become black, but not ripe, and then make trial of Concords as mentioned, he will express the same opinion. But if he has eaten the Isabella in its best condition, and so freely that the idea of its flavor becomes distinctly impressed, he will say the Concord is poor — not so good as Isabella. If, after these have

been eaten for some days, or weeks, he eats plentifully of well-ripened Catawbas, he will not only pronounce them greatly superior, but will experience new delight, and begin to say he did not before know there was such excellence in grapes, and he will begin to be able to sympathize with those who esteem the grape the best of fruits. He will at length discern the elements, or sub-flavors, of which the Catawba flavor is composed. He will now become conscious of particular defects and objectionable qualities in the others, and in time he will not be able to find any enjoyment in the others, unless after long abstinence from the Catawba, and at length absolutely no enjoyment from them, but an increased enjoyment of the Catawba, if he is so situated that he can obtain it plentifully from the vines, or taken from the vines and kept under proper circumstances until eaten. Grapes recently taken from the vines have a briskness and spirit that is soon lost if they are not kept closely confined in boxes or a close room. Although he will find much enjoyment in the Catawba he will be conscious of defects, and earnestly desire something without them — his appetite for *good* grapes is by this time developed.

To a person who has been accustomed to the best European kinds, such as Rose Chasseals, the different Frontignans, Riessling and Traminer, those mentioned will be so objectionable that he will pronounce them all bad, and the Catawba only least so. The taste that has been formed to the refined purity and delicacy of these kinds, will not be likely so far to lose its habitude, if in a mature person, as to ever find employment in such American kinds as have been named — but will find so much more enjoyment in the kinds of his own country, and will put so high an estimate upon the grape as a fruit, that an American who has known only the kinds named, of which Catawba is best, will not be able to concur with him in his reckoning of value. And if we present to him the fruits of the vinery, and especially such kinds as the Sweetwaters, Royal Muscadine, White Nice, and Chasselas of Fontainbleau, which is the best of this class, he will still be able only to approach toward the Frenchman's "platform," not to stand upon it; for while he finds in these no positive faults, he will feel a lack of soul — a want of that vital refreshment in which the Catawba greatly exceeds these foreign kinds, even when grown in open air and in best condition; and still more so when they are subjected to the confinement of air in the house, (restriction of brisk movement,) which is necessary in order to obtain great size. He will now find the faults of the natives render them offensive, and the excellence of the foreigners not great enough to make them altogether satisfactory substitutes— better, but not good enough. The B. Hamburg, if grown under the system of free ventilation, will be found far better, especially if, in addition to the freest ventilation, that consists with the maintenance of the perfection of its leaves, the season should be uniformly dry, warm, and long, without extremes, which it is not able to endure without injury, even under the protection of a house. Under these conditions, fruit will be produced of the Black Hamburg varieties that will be suggestive of wine, but not distinctively vinous or eminently refreshing. Much more vinous (winey) and refreshing, under like conditions, will be the Frontignans, and the exquisite Schiraz, extreme in its aromatic sweetness, and of the richest vinous class, Riesslings, etc. The palate and constitution that become accustomed to these, has been incapacitated from any considerable degree of enjoyment of such natives as Isabella and Catawba, and can fully sympathize with the foreign characterization of them "bad." It must be noted, in regard to the foreign kinds, that the skin is generally inseparable from the flesh, and Americans find in that something to offset against the tough acid center of our natives. The person whose taste has been thus trained is ready to build a house, that he may obtain these refined, excellent fruits; and the more so, since by the addition of artificial heat he can have grapes every month in the year, and he can always command a high degree of excellence, circumstances considered, but at an enormous price, not averaging less than $1.50 per pound.

We will now introduce the European from the vine countries to our new kinds, and first, to our best, the Delaware. He is an advocate of the excellence of Golden Chasselas. He first says it is not more than two thirds as large as a medium Chasselas; and on first tasting, says it is not so sweet as his favorite. We say to him it has twice as much sugar, and appeal to the sacharometer, which shows that Delaware contains more sugar than any other grapes. On tasting again, he says it has wine which Chasselas has not, but does not at once admit the superiority that I claim for it. He asks to take some home, feeling that he shall want to recur to it. At the end of a month he says it is very good — excellent, much more refreshing than Chasselas, or even than the Frontignans; and he has learned to eat it without its skin, although its skin is as thin as any of the foreign kinds. He now pronounces it fully satisfactory; and in consideration of its exceedingly high flavor, the bunches and berries are large enough for the full enjoyment of his favorite fruit. Having

learned to reject the skins, he is ready to appreciate Diana, and calls that excellent, "and abundantly large; like great Roussanne, good for wine and for table. Allen's Hybrid he also pronounces most excellent, and growing in estimation with use; as good as White Frontignan, which it resembles. Elsingburg, very rich, spicy, and like foreign kinds, its only objection is its size. Its skin is inseparable from its flesh, but so thin, that it is no more annoying than that of the largest whortleberries. To be fully enjoyed, two or three must be taken at once. Lincoln is excellent — good as Pineau of Burgundy — Lenoir the same, Pauline excellent. Herbemont very good, brisk, and 'winey.'" Now, if we ask him to make trial of the Prolific, he is repelled by its offensive odor; and the same of Concord, but less so. On trial, he finds the skin pungent, and flavor partaking largely of its odor; and the large, fibrous, unripe center not to be swallowed. Isabella, like Black Currants and Catawba, not at all fit for enjoyment. After an experience of years, the judgment remains the same; and so it must continue, for it has made the acquaintance of the highest excellence in its kind.

A person who has known only the thoroughly wild grapes, of which the Hartford Prolific and Northern Muscadine are favorable representatives, will generally be unable at first to perceive and enjoy the excellence of the best; he will miss the thrilling pungency and the strong odor, which are not only not offensive, but even pleasurable to him, as are many other gross things to which the taste has been educated from childhood. But one who has become familiar with the Isabella in its best condition, and calls it good, will, on eating Catawba grapes in their best condition, pronounce them "better"— as much better as his tasting power enables him, more or less discriminatingly, to appreciate the pleasure-giving qualities of each. If he now immediately again makes trial of the Isabella, he will find much less pleasure in it, and may even find difficulty in believing that he is tasting from the same bunch that a few moments before gave him so much pleasure. The more he eats of the Catawba, the more fully he is able to detect and appreciate the excellencies of the Catawba, in which it surpasses the Isabella. He finds a large amount of the refreshing principle, which is small in the Isabella. He is not without the perception of the faults of both, but will find great and increasing enjoyment in the Catawba. If he now makes trial of the Diana in perfection, he will not only declare it far better than Catawba, but be able to point out discriminatingly the excellencies and defects of the Catawba, and also see that the assemblage of good qualities in the Diana constitute it an unexceptionable grape; and he will now begin to be astonished at the large measure of delight that grapes can furnish. Now, on returning to the Isabella, he will scarcely be able to call it good — and all that fall below it he will find decidedly *bad;* and he will fully comprehend the feelings of those whose tastes have been educated in the use of the best foreign kinds. So rapidly will the discriminating power, and the increased capacity for enjoyment be developed, that often, at one fair trial of the different kinds, in which they are brought in direct comparison with each other, a person is enabled to form a true opinion of their general merits as to flavor. But a more extended use, and in quantity, is required to complete the knowledge of them, on which an abiding judgment may rest; for the great value of grapes does not consist in the momentary pleasure afforded while partaking of them, but in the spirit and generous refreshment afforded, which can not be fully understood except by those who have made free use of the wine-giving kinds. Some of the best kinds of peaches possess a large measure of this quality; but to manifest it in the fullest degree they must, at just the right stage of ripeness, be taken from the tree early in the morning, before the sun has had much power upon them. By the afternoon the *spirit* will be gone, the *taste* remaining; but not that full excellence that goes to the making up of "flavor." After a few days of culture, a person of fine perception will be so far advanced in the knowledge of "flavor," that he may sit by the side of a foreign taste of the nicest discrimination, for a critical examination and enjoyment of the Delaware, which both will admit has no superior among the foreign kinds, and none equal among the native Americans, for the full satisfaction of every educated taste. So rapid is the development of this faculty of enjoyment, under favorable circumstances, that as soon as the means are afforded, the great majority of tastes will become so well informed, that only the best will be sought for by the mass of purchasers, who buy freely for themselves and families. The idea of growing fruit for market that is not good enough for "family use," is a purpose to deceive the uninformed, which is not born of benevolence, and can not be measured by the golden rule; and we may with safety hold the faith that it will not continue to be acted upon, when the true state of the case becomes known, which is, that the best kinds can be the most cheaply produced.

TIME OF PURCHASING VINES, AND METHOD OF KEEPING THROUGH WINTER.

Grape vines, for various considerations, are most advantageously purchased and transplanted in the fall, and as early as the ripening of the wood and consequent ripening of the roots will permit. To keep them through the winter, without fear of damage, lay the vines in by the heels in sand or mellow, porous soil so deep that there will be no alternation of freezing and thawing, and where no water may lodge about the roots. To secure from water, an inclined surface or gravelly subsoil affords convenient safety if sand is not at hand. If none of these conditions are present, a little mound must be raised for the purpose. Frost affects sand that is compacted only by its own weight to but little depth; it should be laid on lightly, and the surface be left rough as it falls from the shovel; and if the vines are pruned of proper length for planting, the top should be covered to the depth of a few inches, but the buds should be uncovered early in spring.

Vines should always be planted in very fertile soil, and such as is *perfectly* suited to their wants is rarely found without special preparation by deepening and enrichment

Vines that are in course of transportation in very severe weather, and frozen when received, should be very gradually thawed, without exposure to open air, in a temperature that is but little above freezing. The sand before spoken of affords a safe and convenient medium in which to thaw them; and, if proper care is observed, hardy vines will receive no damage from any severity of freezing, provided they have been well packed in dry moss.

TIME OF PLANTING.

Vines planted in the fall, if the operation is properly performed, are in no respect less safe or less advantageously situated than those planted in spring, while on the other hand, the advantages of fall planting are often important.

These advantages, to a great extent, may be had by having the vines on hand laid in for the winter, as directed on page 47. Early fall purchasers have generally a great advantage in the quality of the plants, and the time thus afforded for transplanting and packing in the best manner, as well as for transportation and planting, is very favorable, both to producer and purchaser.

AGE AND CHOICE OF PLANTS.

Well-grown layers of vigorous growth that are abundantly furnished with thoroughly ripened roots, as well as wood, are best, and for the garden especially when early bearing is desirable. They will give fine fruit the first season, and also good wood for propagation which, in some of the new varieties, is worth more than the price of a vine.

Plants well grown in large pots from single eyes rank next to layers, and may be expected to give specimens of fruit the second season, but not a considerable crop until the third. Plants from single eyes may in very large pots gain sufficient size and maturity to bear the first season, and be but little inferior to best layers. The prevalent opinion that older vines will bear earlier is erroneous, and the fact is well ascertained that they are not so healthy or productive. All vines that have made a good growth the first season should have their roots shortened before growing a second, to induce them to send out plenty of fibres near the centre or stock, and the aptitude for doing it is in a great measure lost if deferred to the second season. Vines which do not make a good growth the first season for general purposes, may be rejected as worthless; but of what may be called good growth there are different degrees, the lowest beginning at that which gives some strong, ripe wood, with a considerable amount of well-ripened root, and a healthy centre where root joins wood. But the difference between a tolerably good plant, and one of surpassing quality, can not well be represented by money to those who wish the early and full enjoyment of the vine, or for its long continuance in vigorous health and exemption from casualties.

PLANTING.

In planting the vines, if the border has been so recently prepared that the soil is not apparently one homogeneous mass of dark mould, a sufficiency of fine rich garden soil should be placed around the roots to receive their first growth, and it will be advantageous to have it sufficient for their entertainment during the first season.

The plan is drawn to a scale of half an inch to the foot, and the vines are planted two feet apart.

They may be planted at once on a line with the trellis, but in that way it will be impossible to fill the border uniformly with the roots, which is a very important consideration.

If the border is twelve feet wide and has a southern aspect, the trellis may be placed within two or three feet of its northern side; about the middle of the border, or five feet from its southern edge, plant the row of vines two feet apart, placing a stake by the side of each vine at the time of planting. To begin to prepare for the reception of the vines, dig a broad basin six inches deep—probably about two feet in diameter, and make a nice conic heap of the soil, for it is to remain thus placed all of the season. Now, at the bottom of this basin dig the "hole" for the reception of the vine, as it commencing at the surface of the ground, for the bottom of the basin is to be the surface of the ground for the vine during the first season; place the pruned stem of the vine a few inches south of the stake, and inclining towards it at an angle of forty-five degrees. If the vine is a very vigorous one, and makes a good growth the first season, it will be strong enough to cut back to two feet, which at time of pruning may be done. Next dig a trench one foot wide and seven inches deep, in a line towards the trellis and at right angles to it; remove the stake that was set at the planting of the vine, about eighteen inches along the trench, in the direction towards the trellis; fasten the shoot down to the bottom of the trench, inclining the end of the pruned shoot up at an angle of forty-five degrees, so that it may touch the stake a little below the surface of the ground. Towards the end of June fill up the basin that was made at the time of planting the vine with the soil that was taken from it, and cover the shoot in the bottom of the trench to the depth of about two inches. The second season a much stronger shoot will be made, and it may be cut back so as to enable it to make half of the remaining distance to the trellis, and so proceed until the trellis is reached. This does not prevent taking fruit every year according to the strength of the vine, and the ground will become uniformly filled with roots which will, under good treatment, continue indefinitely in health, and the vine will never, in the latitude of New-York, fail of giving ripe grapes as early as the fifteenth or twentieth of August, according to character of season. The crop thus to be obtained may be easily calculated by counting the bunches on vine marked 4 on plate, which are twelve less than I last season gathered from a vine but four years old, trained in that manner.

The subject is resumed at page 26, and very thoroughly treated, with many illustrative engravings.

PRUNING,

The need of pruning the vine comes from its native habit of climbing, by which it gains the top and extremities of the branches of trees, on which it finds support, to give its leaves to the influence of the sun whose light is to it the *fountain of life*. After the roots have been cared for so that their wants may be supplied within a small compass, the branches must also by pruning be brought to keep within prescribed limits, and the number of its shoots regulated so that just as many large leaves shall be formed as can be fully exposed to the sun, and only as much fruit carried as can be brought to perfection. The shoots and fruit must also be equally distributed over the allotted space. This is a process of such simplicity, and the reasons and mode of doing it so obvious to common-sense, that no one need be in error or darkness in the matter who will give the subject a little consideration. To give full directions for this is not

practicable within the proposed limit of my catalogue, but I shall give such brief directions, aided by engravings, as will make the manner of proceeding clear for the first two years from planting, and also show the completion of the system of training.

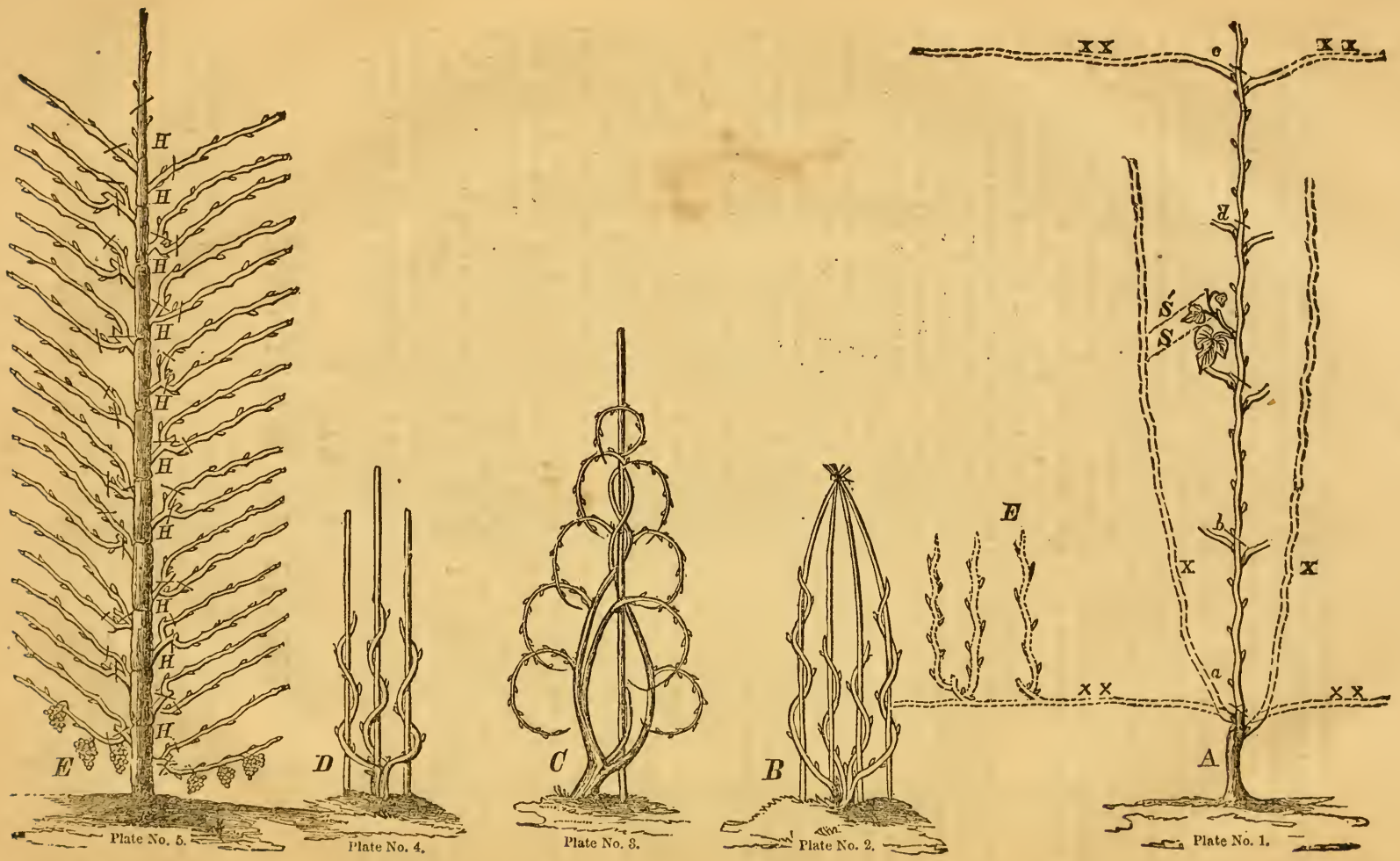
After one strong shoot has been obtained, (see plate 1, A,) the next season commences by starting two, and the height at which these should be taken depends upon the kind of arbor or trellis to which the vine is to be trained, (see a, b, c, d, fig. A.) The system represented on the plate, and called "Thomery," (see plate 2,) has its name from a village near Paris, where it has been in operation more than one hundred and fifty years, with results that have given it a world-wide celebrity. A distinguished French writer, in a recent work on the subject, remarks that the "unequalled prosperity of this vineyard depends upon neither soil nor exposure, for both are rather unfavorable, but upon the excellence of the system, and the care with which it is managed." The statement of its productiveness appears incredible, but the most important consideration is the surpassing *quality* of the fruit, for which three times the price of ordinary well-grown grapes of the same variety is uniformly obtained. The system was originally devised for a trellis in front of a wall which was built for affording shelter and a warm exposure. The vines are not trained on the wall, but on trellises placed from nine inches to two feet in advance, to afford a healthful circulation of air between.

Although it is well adapted for the open ground, and for a trellis running in any direction, its best results, except in very warm latitudes, will be obtained under the shelter of a high garden fence or wall, or on the south side of a house, for our native vines can scarcely have too warm an exposure. To grow them on the southerly side of a house, the trellis should be from eighteen inches to two feet from the building, and may be at any height desired. A single system requires from eight to ten feet of height, measuring from height at which first arms and fruit are taken, and any width convenient greater than eight feet. A double system may as readily be applied by which an elevation of from sixteen to twenty feet may be covered, measuring, as above, from elevation at which lower or first arms are taken. This may be at any elevation desired. According to such an arrangement, I have, during the past twelve years, on the south side of my dwelling, trained vines that have borne profusely, and ripened their fruit nearly or quite two weeks earlier than those in the garden, not more than one hundred feet distant. The house is on the line of the street, and the border occupies the entire walk, twelve feet in width. Before planting, the ground was trenched three feet deep, and abundantly enriched with stable manure and wood-ashes thoroughly mingled with the soil or rather gravel. Flagging was laid, and it has received no enrichment since, nor has any apparently been needed. The lower fruit-bearing courses are about twelve feet above the walk to avoid depredation. Aside from the great quantity of superior fruit yielded, we have been indebted to our vines for a most beautiful and delightfully cooling shade, for which, I think, no vine can excel the grape. I have described particularly because the best situation for the vine is often overlooked.

It may be noted that vines in particularly sheltered and warm exposures, although ripening their fruit sooner, will hold it in perfection later than those not so situated, and that it will not be damaged by any freezing that occurs before December.

The first season only one shoot should be suffered to grow, and that should be trained to an upright stake set into the ground at the time of planting. The tying should be so frequently done as to keep the shoot always upright. If suffered to bend over, the strength will go to the formation of secondary shoots that spring out in the axils of the leaves, (at the junction of the footstalk of the leaf with the main shoot,) and are called laterals. (See plate No. 1, Fig. A at s s'.) These laterals should be all taken off at one leaf (see s) as soon as they have made a length of three leaves, as the strength that goes into them is taken from the leaves of the main shoot while they give back but little to the formation of root or to the general strength of the plant.

At the time for pruning, which we will suppose the month of February for the pres-


H
H
H
H
H
H
H
H
H
H
H
H
H
E
D
C
B
E
X X
c
X X
d
S
S
b
X
X
a
X X
X X
A
Plate No. 5.
Plate No. 4.
Plate No. 3.
Plate No. 2.
Plate No. 1.

ent, this shoot should be cut back to the lowest well-developed bud, which will be near the ground, and the same course of tying and removing laterals pursued as directed the previous year. If the vine is a very strong one, it will show bloom for three bunches of fruit, which may be suppressed or suffered to go on to maturity according to the strength of the vine. If the vine is of the strongest character, and of prolific habit, fruit may had the first season and two shoots grown the second season, as will be hereafter shown; but a strong one must be grown before attempting to grow two.

DESCRIPTION OF PLATES.

PLATE No. 1.

A is a vine of one upright shoot, as a strong vine should be at the end of the second season; s s′ is a lateral springing from the axil of a leaf that has been twice pinched at one leaf each time, first at s, and second at s′. Every bud on the shoot had a "lateral" that received similar treatment, or perhaps that required pinching a third time.

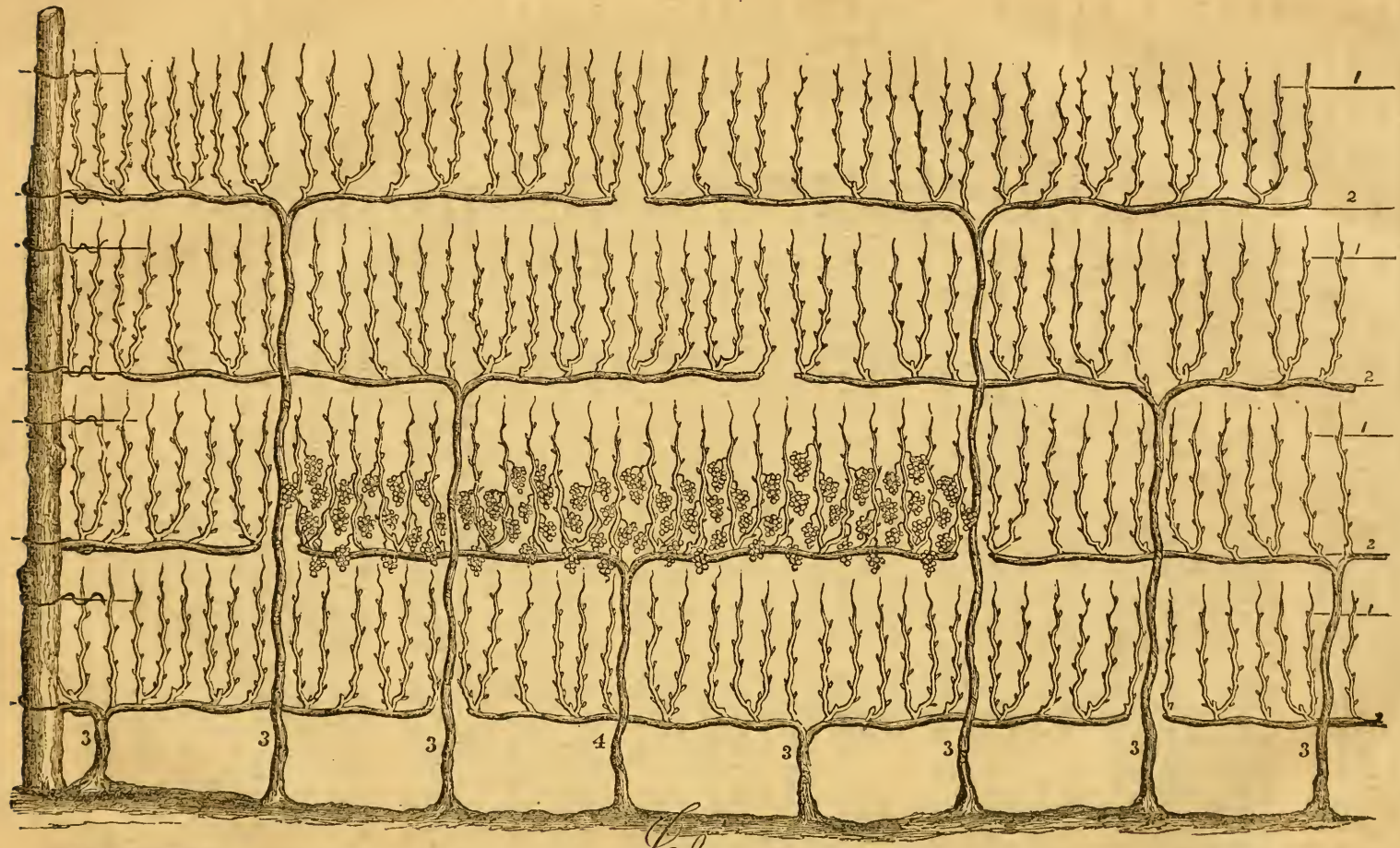
a, b, c, d, e, are the points at which it may be cut to fit it for the Thomery system, as shown in plate 2; x and x are two shoots at the end of the third season, whose treatment has been the same as was that of A during the second season. x x represent the same shoots laid down for arms, four feet long each way from the standard; on the left but a portion of the arm is shown from deficiency of size of plate. On the left below, two shoots, one double and one single, of the lower course are shown, by dotted lines at E, growing out of arm x x. (See complete system in plate called Thomery, plate 2.) In like manner, arms might have been taken at b, c, d, or e, as indicated by the faint lines showing where shoots might have been, instead of at a.

For a single system only one pair of arms are taken from one vine; at the height of b, another pair are taken from another vine, and so on, as at c, and d, and e. The shoots spring from one bud on each side, and all of the other buds are rubbed off. If a double system is required, so that the standards may not be inconveniently near to each other, two sets of arms are taken; we may suppose one set at d, and another at e, or if desirable at a much greater height; but if at a greater elevation than at e, another year will be required for the preparation of the cane for a standard. It may be remarked that the long growth of one year is called a shoot. If it is for the next season, cut short—that is, the length to one or two buds—it is called a spur; if the length of a foot or more, it is called a cane. After the second year the cane becomes a standard. (See plate 11, where the standards support the arms at different elevations, and the arms support the "cordons," or courses, on which the fruit is borne.) See 4.

B and D are elegant methods of growing vines on stakes, and suitable for the garden. C is the German method of making bows, and is suitable for vineyard or garden, and E is a short spur and renewal plan, well adapted for gardens.

At the stage shown in the plate, it is supposed to be fourteen years old. H below marks the third or perhaps the fourth year; and at H above each succeeding year is marked, adding a spur and two shoots on each side yearly, or rather each year adding a shoot on each side, and at the same time converting the previous year's shoots into spurs, each bearing two shoots. Every shoot is supposed to bear three bunches of grapes, and every shoot alternately by pruning becomes a spur, bearing two shoots, and every spur is alternately renewed, so that it may be called a biennial short spur renewal system. For the garden this is quite ornamental, and in skillful hands will work admirably; but is far less simple than that shown in plate 2, and if for want of care or skill the lower spurs be lost, the loss may be considered final.

All systems suppose one upright shoot to be provided, as at A, to start from at the beginnng of the third season, except in case of layers of remarkable vigor, when the course of training may be commenced at the beginning of second season.



DRAWN BY MRS. GRANT.

Chomery.

HOLTON ENG. N.Y.

PLATE No. 2, OR THOMERY.

The disposition of vines is strongly upward, and also to leave the things that are behind or below; and vines, under ordinary circumstances, will not continue to make bearing-wood for a succession of seasons through a greater perpendicular height than four feet, and even in this little scale the upper portions will show the most vigor of growth, and the lower the best flavor of fruit, but not the largest or most beautiful bunches. In view of these facts, a plan was devised by which a trellis of any desirable dimensions might be uniformly covered with wood and fruit under the circumstances that would enable the vine to bear the greatest amount and of the best quality, and continue in perfect health indefinitely. This can be done only by balancing nicely all of the tendencies of the vine. Due accommodation must be provided for the roots, and they must be made comfortable and patient under a very unnatural restriction. The branches also must not only be restricted within certain limits, but the *natural disposition* to leave their boundary restrained.

This can only be accomplished by beginning in reference to the end while the vine is very young, or rather with its beginning. The direct end to be aimed at we will suppose to be the covering a trellis, like that represented in the plate, with bearing-wood that will produce a crop of fruit like that shown at 4, (see plate.) This plan was devised more than one hundred and fifty years since, and its operation has been unexceptionable. Various modifications to suit particular circumstances have been adopted, but no improvement has been made upon the general plan. Instead of allowing a difference of four feet of elevation for the bearing district of each vine, the bearing-wood is all taken from the same elevation.

At one end of the trellis is seen a strong post, around which wires are fastened. To keep the post upright it must be braced, but the bracing is not shown. At the other end little portions of wire are shown, designated by figs. 1 and 2. The portions of the vine lying along (2) and sustained in place by it are called arms. Those shoots fastened towards the tops to the wires (1) are called the courses, (coursons;) and on 4 are seen properly loaded with fruit, but represented without the leaves, for when the leaves are in place, very little of the fruit is visible. The figure 3 indicates the standards from which the arms are taken. The one nearest to the post and the fifth furnish arms for the lower courses. The second and the sixth furnish arms for the upper courses. The third and the seventh for second courses from the top. The fourth and eighth for the remaining courses, which completes the system, which, when loaded with fruit, will all be like the one designated by 4.

It will be observed that the shoots upon the arms which constitute the courses are alternately in pairs and single. In pruning, to make single ones grow pairs or two shoots from one spur, cut above the first good bud, and that will give two shoots, one, and the bearing-one, from the well-developed bud, and the other from a bud scarcely visible on the vine, and too small to be shown in the engraving. The shoot from the latter will not be certain to bear fruit; at its base will be formed a bud that will fruit, and then the shoots will be established.

To prune the double shoots, cut the upper one off by cutting the spur just above the origin of the lower shoot, and then cut the lower shoot at two buds, by these means the spurs will always remain short. This plan is perfectly adapted to renewal yearly biennially, or triennially, as may be found expedient or to suit the views of the proprietor. To renew yearly, double shoots should be always grown, and the one from the upper bud only suffered to produce the fruit. To renew biennially or triennially, grow alternately as shown in plate, and the method of proceeding is too obvious to require explanation.

By recurring to plate 1, fig. E, the manner of cutting will be apparent, but by error of artist, the fruit on the left will be seen upon the wrong shoot—that is, the one that springs from the spur nearest to its origin from the main stem. This is also equally adapted to renewal or constant bearing, and is called the "cylindric" method.

Both systems are calculated to produce a quantity of fruit beyond the belief of those who are not acquainted with systematic training.

TO GROW ARMS OR SHOOTS DIRECTLY OPPOSITE.

On page 20, Plate No. 1, Fig. A, may be seen a plan for taking arms to furnish a Thomery plan; but it is defective, inasmuch as it does not have them directly opposite each other, except when the base buds are taken to produce the shoots shown by the dotted lines X and X. If they are to be taken from the same cane at *b* or *c* or *d* or *e*, as shown in the engraving, one arm will be three or four inches above the other. We will suppose we are to operate at *e*, and instead of taking the dotted arms X X and X X, we take them directly opposite each other. To do this, we will employ one year more of time, and instead of cutting off the upright cane at *e*, as shown by the cut-off mark above the upper arm, X X, we will cut it off between the dotted arms, throwing away the upper one and training the one at the right in an upright position, to the end of the season. At the time for pruning, cut this upright shoot of the last season (which is called a cane now) immediately above the second well-developed bud. At the base, close to its origin from the main upright, will be seen two much smaller buds, called "base" and "contra-base" buds, which are so nearly opposite that they may be called so, as they will not vary from that more than the small fraction of the tenth of an inch. These buds are to form the opposite arms, and to enable them to do it, the two buds above, which were reserved at pruning, must be rubbed off as soon as they have pushed forth to the length of an inch, or less. This will cause the two base buds to push forth, which are to be trained in an upward direction, and these will form arms directly opposite, to be laid down the next season, and pruned to such length as their strength will warrant. See Fig. 2, page 38, letters *b* and *c*, for manner of forming the arms, and the length to be taken each year.

But there is a better way to do it, by which no time will be lost, for the two base buds may be formed on the main upright cane without any material loss of time or of strength to the vine.

Plate No. 38.

Here we have three fine upright vines, in proper condition to be operated upon at about the middle or last of June.

To form arms for Thomery plan, one may be taken off at the eye nearest below the point three feet from the ground, and the next five and the remaining one seven feet from the ground. These vines, as shown by the engraving, have had their laterals properly pinched, and have been well secured to the stakes. The laterals are to be taken away entirely at the point where the main shoot is taken off, just above a leaf in whose axil will be left only the dormant bud. By taking off the main shoot, and removal of the lateral, this dormant bud will be pushed forth, and in a few days will form the shoot, A. This is to be treated in all respects as if it were the principal shoot, until the end of the season, and the next season its base buds are to form the two opposite arms. The pruning to two well-developed buds, and the rubbing off, are to be managed as before directed.

Plate No. 39.

There are other methods of forming the arms by making use of the lateral for one of them, but it is difficult if not impossible to have the two arms similar in character and strength, except by the process of taking from the two base-buds, according to one of the methods described.

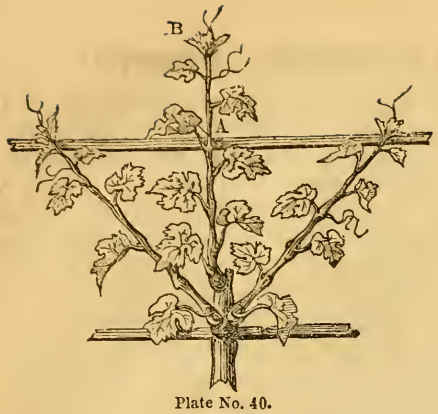


Plate No. 40.

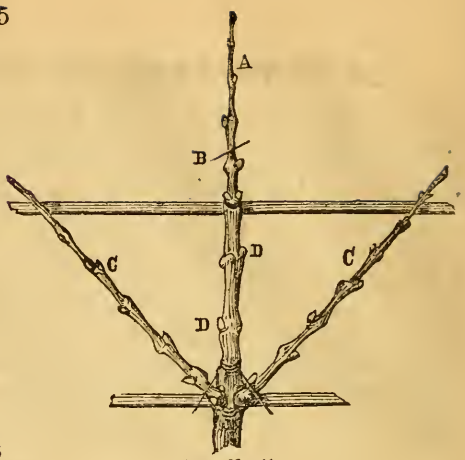


Plate No. 41.

To form the arms, only the shoots that spring from the base buds are retained; but to grow vines with shoots opposite, the one that springs from the first well-developed bud must also be retained to continue the vine, as shown in the engraving A B. At A the same operation is performed in June as before described, pinching off main shoot and suppression of lateral. In engraving A, B, C, D, may be seen the manner of pruning at the end of the season, and in the next engraving the manner of proceeding for any length of stock. It will be observed that the shoots C, C, are pruned so as to take shoots only from the base buds. In the next engraving the double shoots may be seen formed, as they are in full bearing, and the pruning of these shoots should be noted, the upper one being cut away by cutting through the spur, and the lower one being cut so as to form a new spur with two buds. Above may be seen the two shoots marked for pruning, as the lower ones were the year before, and the shoot above prepared as before also

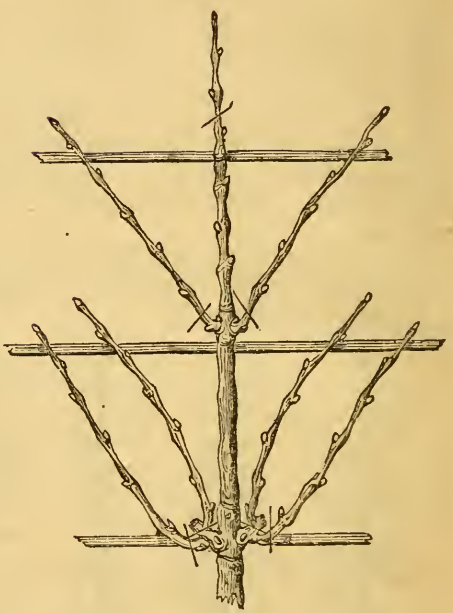


Plate No. 42.

There is a very good mode of training from one single upright stem upon a trellis in front of a sheltering wall whose hight may be from four to six feet. After one upright cane has been produced, shoots may be taken from buds at each side that are found at about the right distances apart. That will be about two feet apart on each side, or a little less, so that shoots being taken alternately will be distant from nine to twelve inches. These shoots will "show" three bunches of fruit each, but two will be quite enough for them to carry. At the time of pruning, they may be cut to the third bud.

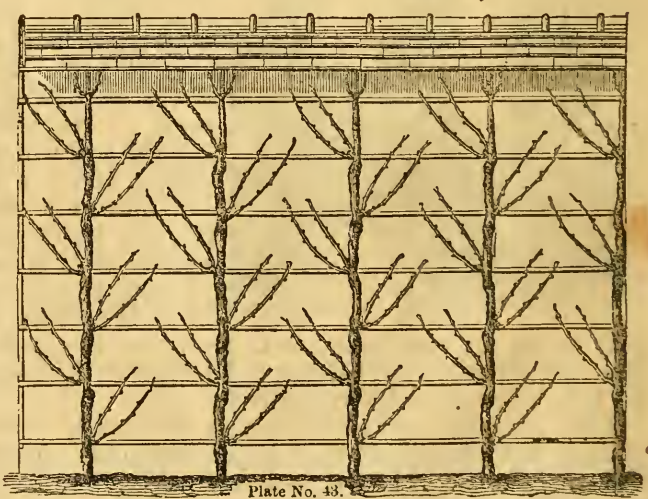


Plate No. 43.

GENERAL AND SPECIAL METHODS OF PLANTING THE VINE.

After the border has been prepared, according to directions, it is a very simple matter to plant a vine so that all of its requirements, which are few and obvious, shall be supplied; and yet very few are so planted, while very many are either enfeebled or destroyed by the improper performance of the operation.

A well-rooted layer offers the most convenient form for the exemplification of the general principles that are to be observed in all cases.

The length of the portion of preceding season's wood, from which the roots spring in the best vines, is from twelve to sixteen inches, and may be called the vertebra. The long, fibrous roots, which spring from each side of the vertebra, should all be cut back to about eight inches, so that when spread out on a plane, the space covered will be about sixteen inches square.

The excavation for its reception should be made seven inches deep, in ordinary soils, but one inch less in very clayey ground, and eighteen inches square at the bottom, which should be made level at first, care being taken to avoid a depression at the center, or any elevation at the sides. A little ridge is then to be raised two inches high, running through the center, in the direction which the axis or vertebra is to take, and upon which it is to lie, raising it two inches above the general level of the bottom of the excavation.

Before putting the vine into its place, have the stake that is to support it set, and a quantity of such soil as has been directed for putting among and near the roots made fine and ready in a little heap. After taking a survey of the plant as it is placed upon the ridge, and determining how many of the roots are to lie upon the bottom of the excavation, raise up carefully all of the others, and adjust those that lie upon the bottom to equal spaces from each other, when they are ready to receive a layer of soil, which is to be *poured* gently from a *spade*, and made sufficiently compact with the hands of the operator, when it will be ready to receive the next row of roots, placing them, as was done with the lower ones, at equal distances, and so that all of them may be included in the depth of the two inches, with the thickness of the vertebra added. The other side is to be managed in the same manner, care being taken to make the soil uniformly compact around the axis at all points, which, at this stage, will have its upper side level with, or slightly below, the surface of the filling. When some of the roots spring from the upper side of the axis or vertebra, they require to be raised a little above the depth of the two inches named.

The remaining four or five inches of depth is to be filled by letting the fine soil fall as if *poured* or sifted from the spade, making it evenly compact, by layers of about one inch in thickness at a time, until the hole is filled.

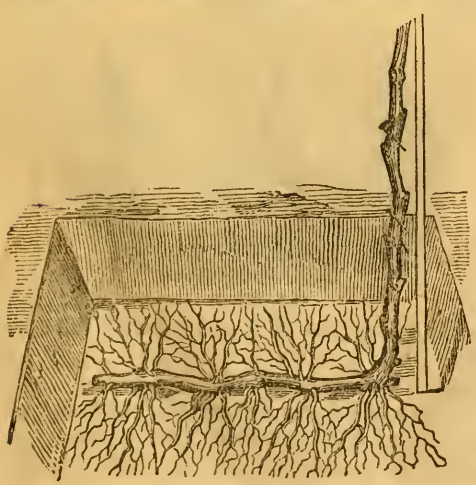


Plate No. 7.

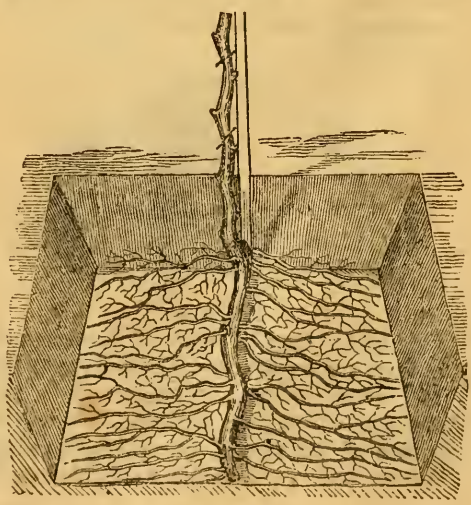


Plate No. 8.

Plate No. 7 represents a layer in side-view, as seen from the east, having its roots pruned, placed in an excavation seven inches deep and eighteen inches square, with its axis or vertebra from which the roots spring lying upon a ridge two inches high, running north and south.

Plate No. 8 represents the same as seen from the south, ready to be covered with soil.

In planting, let the axis be kept immovable by gentle pressure, the operator facing the east, and laying the back of his hand lightly upon it about the middle.

On the right or east side twelve roots will be seen, five of which are to be gathered up into the left hand lying with its back upon the axis. In taking up the roots, count from the south or the end farthest from the stake, taking the second, third, fifth, seventh, and eleventh, holding them away from those that are left lying, which are to be equally spaced, and covered with about an inch of soil, or perhaps a little more, having the fibers also of each root carefully distributed and separated in the soil. This being done, place the five that have been held in the left hand in the same manner.

On the left or west side, take up the first, third, sixth, ninth, and eleventh, with which proceed as before, covering the last, as before directed, working the soil carefully to its place with the hands.

When the purchaser receives the vine, it will be cut at the upper mark. After the planting it is to be cut at the lower mark; and when the shoots have become strong enough to permit one to be tied, the other is to be rubbed off, retaining only one for the benefit of the vine, or three if for immediate bearing.

Danger from drought is to be guarded against, or some injury will be sustained, often to the loss of nearly a season's growth, and not unfrequently to the destruction of vines that have been planted in the best manner, but afterward neglected in this respect.

The severity of drought is caused more by the effect of drying winds than by the absence of rain, and does not occur to a great extent in grounds that are sheltered from their influence.

A moderately moving atmosphere does not take, during the day, more moisture than it returns to a well-prepared soil at night; consequently, protection from the strong action of the wind will in a great measure secure from the severe effects of drought, as shown in blight and shriveling of the foliage.

Thorough shelter from at least two of the four quarters is very desirable for all horticultural subjects, but a very simple arrangement will protect newly-planted vines from all danger of injury.

Two boards, each one foot wide and eighteen inches or two feet long, nailed together so as to form a right-angled triangle, with one outer side facing north and the other west, placed so as to contain the plant within the angle, as shown in Plate No. 9, forms a very cheap and pretty good shelter.

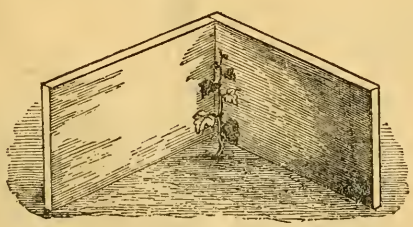


Plate No. 9.

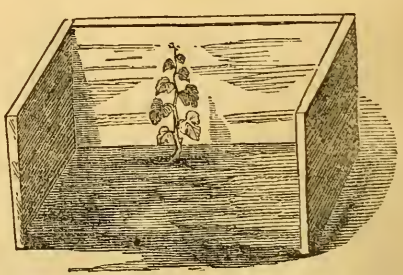


Plate No. 10.

One better may be made of three boards, forming a square, to be placed with the open side facing the south-east, as shown in Plate No. 10.

A box without a bottom, or made to receive a sliding-pane of glass, forms a still more effective shelter, and one that will enable the plant to make an important start in advance of the season, by which it will regain all that has been lost by transplanting.

Vines with very small roots, although perfect in health, can not be covered with

much depth of soil without being destroyed, and they can not endure the absence of moisture, which they must often incur when near the surface, without being destroyed.

To have the border become completely and uniformly occupied with roots, fiber, and rootlets, from its surface to its depth, the beginning of growth, after transplanting, must be at some distance from the surface, so that the center, from which all the roots spring, may be toward the middle of the perpendicular measurement of the border, or below it when worked only of moderate depth.

Instead of placing the axis of the vine, which we have just planted, at four or six inches from the surface, a temporary surface is made, from six to ten inches below the level of the border, to which the vine bears the same relation in planting, as it has been made to sustain, by the operation just described, to the actual level of the border.

The excavation being made to whatever depth may be fixed upon, which will depend upon the size of the plant in some degree, as well as upon the circumstances of the border, and from eighteen inches to two feet in diameter in each direction, the planting is to be done precisely as before directed, leaving from six to ten inches of the excavation unfilled, and keeping it clear to that depth during the growing-season.

This little pit furnishes the shelter which is so important in the vineyard, especially where it would be rarely given otherwise; and the temporary surface being below the action of the drying winds, is easily kept from an injurious degree of drought.

If watering becomes necessary, there will not be need of frequent repetition, and the quantity required to be effective will be very small, and it must be noted that watering while the sun shines, except when it is low, is not safe.

At the time of planting, if the weather is very warm and the soil rather dry, one quart of water to each vine, from the fine rose of a watering-pot, will often secure a good season's growth that would otherwise be very small.

The weather is never too hot or too dry for our best hardy vines, if the proper conditions are furnished for their roots, and the leaves are protected from exhausting winds.

When vines are grown in different forms from the layers, as from single eyes, a little modification is required in forming the bottom of the excavation.

The roots which radiate from a center should have that center placed upon a cone instead of a ridge. The same attention is required in placing the roots which are also to be pruned.

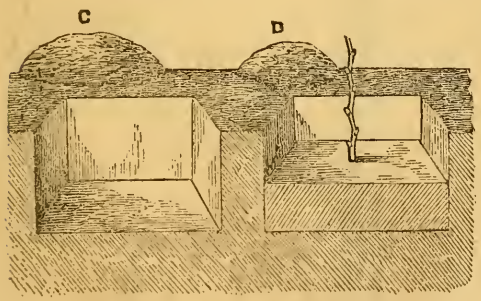


Plate No. 11.

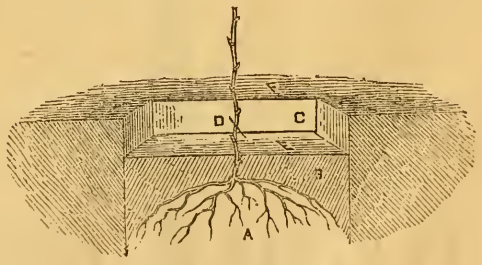


Plate No 12.

Plate No. 13.

The excavation shown in Plate No. 11 is for a very strong vine, like the one represented in Plate No. 7, or in No. 8, but the plan is upon a very small scale, and is sixteen inches deep, four inches of which is to be filled with fine soil, and the little conic elevation of two inches, upon which the center is to rest, is also to be made of the same. The covering of the roots will be four inches above the top of the cone, which will leave a cavity of six inches, as seen in Plate No. 12, where the planting is represented as completed. At D is seen a mound of soil, which is to remain during the season of growing, after which, late in the fall, it is to be put into the excavation to remain, if the vine has made a strong growth; but if only a feeble cane has been pro-

duced, it should be taken out again in the spring, to remain out another season. The deep covering does not affect strong vines injuriously, but small ones can not endure it.

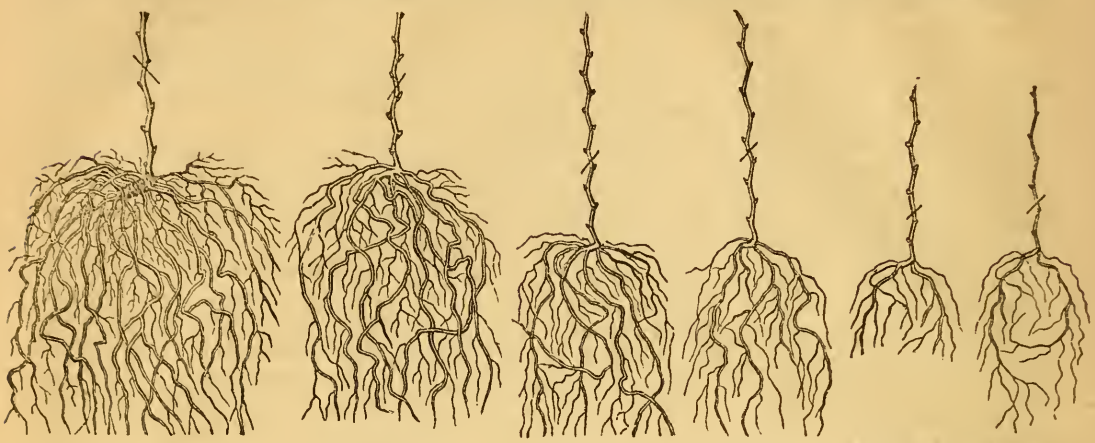


Plate No. 19. Plate No. 18. Plate No. 17. Plate No. 16. Plate No. 15. Plate No. 14.

A very small vine is represented in Plate No. 14, drawn to the same scale as those represented in Nos. 7 and 19, and rates as No. 4 or 5, having a cane from one to two feet long or a little less. The same is represented after root-pruning in Plate No. 15, having the roots cut back and about six or seven inches in length.

For such plants a much smaller excavation is to be made, and the covering of the roots, measuring from the top of the cone, must not be more than an inch and a half or two inches in depth, which will leave their ends covered four or five inches deep, so that, with sufficient attention, they can be kept in constantly healthful moisture.

In Plate No. 13, A represents the cone with the roots spread upon it; B, the depth of covering; E, the temporary surface; D, the place for cutting, and F, the surface or level of the border. Such plants will never die under proper treatment; but proper treatment for these is very different from that which stronger plants require

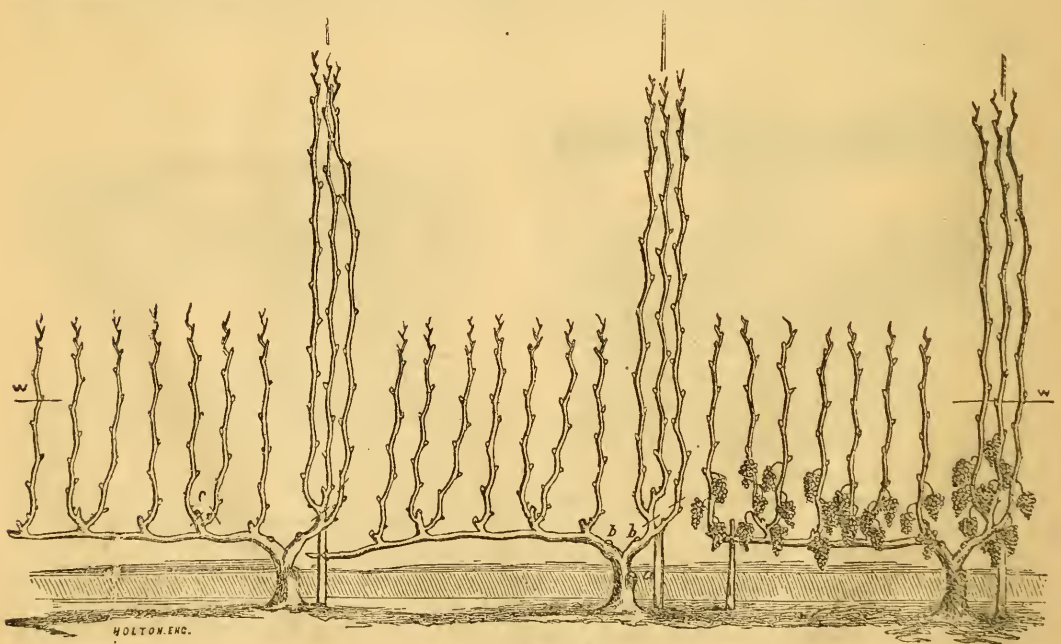


Plate No. 20

It will be apparent that such plants should not fall into the hands of any but good cultivators, who are willing to employ one year of assiduous attention to bring them to a size that will endure the ordinary trials of the seasons without extra care.

A plant of best character may easily be so treated as to lose all of the excellences of its beginning.

The course of treatment which I am now about to recommend is calculated to complete the development and maintain the excellence of the best, by affording the most favorable conditions for the roots and canes at every stage of their progress.

The method of occupying only a moderate space of ground with each vine, after full establishment for vineyard culture, and of training it accordingly when the vine is of compact habit, has been found by long and extended experience to be the most advantageous in consequence of the facilities which it affords for controlling both roots and canes, upon which successful management depends.

After setting the vines at a certain depth, with an excavation to remain open during the season, and filling it in the fall, there remains for the vineyard one operation to be performed, at the beginning of the next season, to complete the planting.

The operation is called layering, but more properly bedding, as I shall hereafter designate it, and is needed to perfect the plan of planting the vine so that it will completely and uniformly occupy the space allotted to it with fibrous roots, which will have their center or axis at any desirable depth that may be fixed upon.

A trench is dug one foot wide and to about the depth of the principal roots, which will be to the top of the cone or mound in the case of single-eye plants, and to the top of the ridge if a layer.

The length of the bedding distance may be sixteen inches, and the stake by which the cane was supported last season may be moved that distance, which will place it toward the end of the trench. The cane is to be cut so that it will be long enough to lie along the trench a distance of sixteen inches, and turning up against the stake, place one bud at the surface of the ground from which the cane of the next season is to spring.

The bottom and sides of the trench must be made inviting to the formation of roots from the portion of cane laid in it, and may be half-filled at the time of laying down, making it compact as at planting, the remainder to be put in at mid-summer. At the bend, where the vine turns to ascend by the stake, a stone the size of a fist, or a little larger, may be used to keep the vine in place, holding the stone with one hand while the soil is made firm upon it with the other, so that the bend may be as nearly angular as the vine will permit without breaking, which will favor the early formation of roots. When the vines do not make strong canes the first season, the operation must be deferred until the next, in which case the cane must be cut down to the bud nearest the surface of the ground; and if the past season's growth has been very feeble, the cavity of the first season must be again opened to give its feeble roots the most tender treatment.

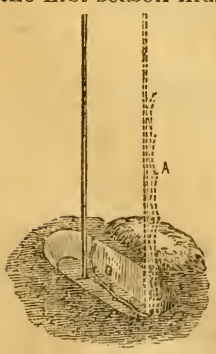


Plate No. 21.

Vines planted in this manner will not be damaged by judicious plowing, at proper seasons, which is indispensable for the economical performance of the tillage that is requisite for the prosperity of vineyards. Plate No. 21 illustrates the description of the operation. The dotted lines, A, represent the stake and cane of last season in their place; B shows the trench, with the cane pruned to the proper length lying in it, and the stake in its new position.

The oblong figure of three by four feet occupied by one vine may be divided by imaginary lines into three portions, each sixteen by thirty-six inches, and the roots of the vine, with few exceptions, will traverse nearly equal distances, and consequently be of nearly equal length in occupying all of its parts in the manner here directed.

To plant vines for the plan shown on page 31, if the fence is six feet high or upward, and plants of ordinarily good quality are used, they should be set

three feet in advance of the wall, to be brought sufficiently near to it by two stages, which will require three years. If better vines are used, it may be done in two seasons, and, with the best, in one; while with inferior plants four seasons will be required.

The plan shown on page 29, Plate No. 20, is more generally adopted than any other, and may be regarded as the best. The space occupied is three feet, in the direction of the rows, with the rows four or five feet apart, which for the Delaware may be taken as the best distances, in consideration of both tillage and production, in connection with the general management.

To plant box-layers for occupying the border and the wall the first season, make the excavation as directed for the large layers, page 28, Plates Nos. 11 and 12, so that the cane will stand, when upright, two feet and a half from the wall, the farthest portion of the roots being nearly four feet from the wall, if the vines are destined to occupy a border five feet or more in width. If less, place the box by so much nearer to the wall. Set a stake six inches from the wall, that is, two feet from the cane, and make an inclined plane from the box to the stake, so that the vine may rise to the surface as it reaches the stake. Only one bud should be permitted to make a shoot, the other one being rubbed off when the one that is to be retained has become strong enough to be safely tied to the stake. About the middle of June, when the new shoot will have become a cane two feet long, unfasten it from the stake, turn it to one side with the cane from which it springs, and secure it to a stake set temporarily for the purpose, and then deepen the place occupied by the inclined plane, making it a trench one foot wide and nearly as deep as the position of the vertebra of the box-layer, which will be about three inches above the bottom of the box. Make the soil as inviting as possible, and cover the last season's cane in it three inches, or, if the weather is hot and dry, four inches deep. An inch of well-rotted manure may be spread over the top of the covering, and if there is a deficiency of rain, the trench may be watered once a week for four weeks, when two inches more of soil may be added, leaving the remainder of the trench open until the end of the season.

If fruit has been left upon the cane, it will not be in the least disturbed by the operation, and the vine at the end of the season will be as far advanced as a simply good one would be at the end of two years.

When this process is executed, it may be advisable to omit taking any fruit the first season, in order to obtain a fine crop the second, and enable the vine to fully occupy with its ornamentation the place for which it is destined at the same time.

Such as would be called good layers are represented in the engraving, Plate No. 22, and the process, as may be seen, is represented occupying three years.

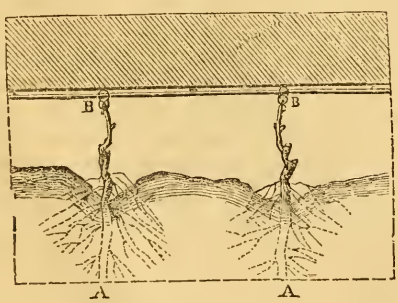


Plate No. 22.

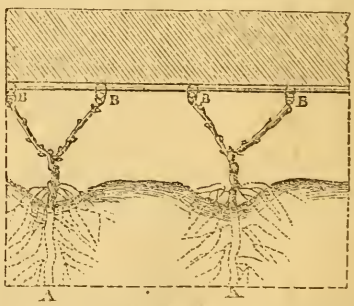


Plate No. 23.

To plant for the plans shown on page 56, Plates No. 60 and No. 61, different methods from the preceding must be adopted. The standards being only about fourteen inches apart, will not afford sufficient room for the root of each abreast.

Two different plans will meet the requirements of these cases. One is to plant a row as just described, bringing the standards to the wall in the same manner, but training them for bearing at the upper half of the wall.

At the same time plant another row in a border of equal dimensions, lying immediately in advance of the first: proceed with the standards as with those of the other border, by bedding, which will bring them to the edge of the first border at the time the others reach the wall. Instead of pruning as if at the foot of the wall, cut the canes of sufficient length to reach the wall by bedding with the portion to turn up at the end. Keep these upright, and grow next season's canes from the upper buds of these, which will require tall stakes, as the vines will be two stories high at the end of the season. The hight may be much lessened by laying the last season's canes nearly horizontally, and only so far from the ground as will prevent their disposition to send down roots into it. The next season these may be laid down in little conductors made of tiles, bricks, or boards, placing them so low that they will be out of the way in cultivation, and treating them as if they had reached the wall in the ordinary course. After the wood has acquired one additional year of age, the disposition to root will be lessened, and the ground through which they pass being occupied, will be so little inviting that very little difficulty need be apprehended from that source. If roots should form, it will be only during the first and second seasons, and they may be easily removed.

The other plan is rather more simple in execution, but not quite so satisfactory in its results. It will be understood by a glance at Plate No. 23.

Half as many vines are planted as the number of stocks required, and, by bedding, brought half the distance from the place of planting to the wall, when, instead of taking one cane directly to the wall, two canes are grown, which are taken obliquely to the wall at the places where they are wanted, at B B. By this course one year more is required than for bringing the first set to the foot of the wall, and one year more will be required to bring the plan to full bearing.

For cases like this, box-layers with two canes are grown, by which the time required is lessened by two years or more, and a good crop of fruit obtained the second season, or three years sooner than by the use of ordinary vines by the last method.

One more plan, the Thomery, remains to be more fully discussed, and this is much the most important of any, and for garden planting it may be said to comprise the advantages of every other plan wrought into a harmonious system, which gives the most perfect control of roots and canes upon an extended scale.

It comprehends much more than is generally understood to belong to it; not only affording the best means of making all natural advantages available, but constituting the base to which may be superadded the use of all horticultural appliances in the most effective manner for the production of grapes at any season.

Although we have now to consider chiefly the entertainment and management of the roots, that can not be entirely disconnected at any point from the plan of training.

The idea of the principal object to be considered in planting may be gathered from a careful inspection of the representation of the roots in the border, by Plate No. 24.

For this system, the vines should be of excellent quality, and those for the wall trellis of the very best, such as are called box-layers being the most advantageous, and the best layers without soil rank next.

The vine represented in the plate was a good layer, but not nearly equal to that represented in Plates Nos. 7 and 8. It was taken to the wall by three beddings, as represented by Plate 25.

At planting it was placed with its vertebra fourteen inches below the surface of the border, according to directions given on page 26, see Plate No. 25. After making a good cane the first season, as seen at A, which was cut at the mark and bedded to correspond with the vertebra of the original plant, producing at the end of the second season the two canes as seen at H. The cane A and stake disappear from their position, it must be understood, before the beginning of the second season, leaving no mark upon the border of having been there, the cane being pruned as marked, and bedded to produce the two canes at H, which are also to disappear, one of the canes to be removed by cutting through the old wood as marked below the ground, and the other to be cut where marked, to produce a third portion of the extending vertebra, and the three

canes C. All vestiges of H having disappeared, as A did the year before, C is now about to disappear in the same manner, two of the canes being removed by cutting through the old wood below ground at the mark, and the other being pruned also as marked, and bedded to produce the three canes D, the vine now having arrived at the wall, with a train of roots springing in all directions from the vertebra which traverses the border at fourteen or sixteen inches below the surface.

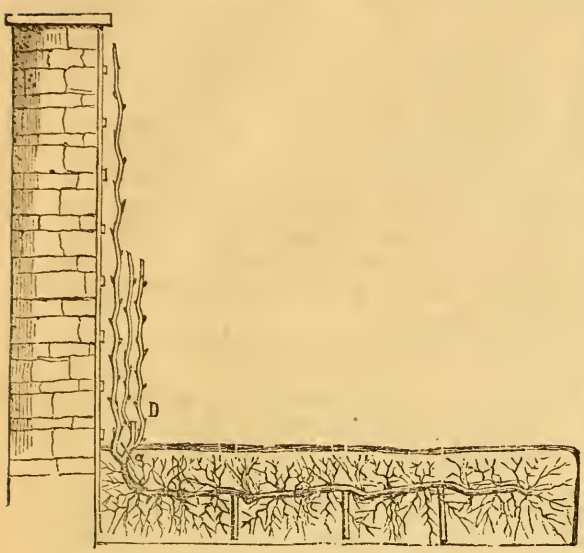


Plate No. 24.

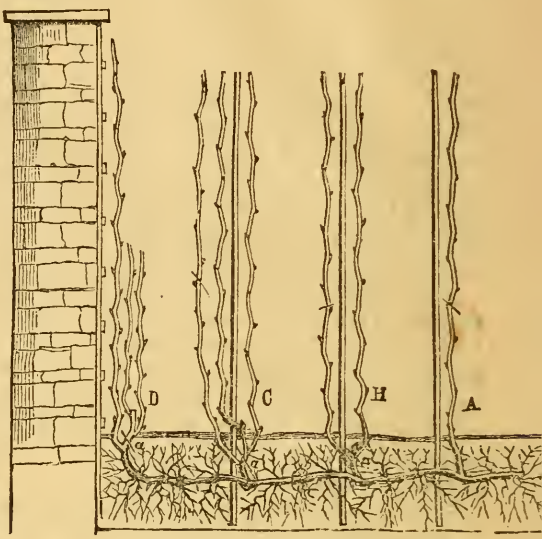


Plate No. 25.

By this means the parallelogram two feet wide, extending the breadth and depth of the border, becomes accessible to all of the roots, at nearly equal distances, each portion offering some peculiar attraction, so that no part small as the fraction of an inch remains unoccupied; all of them during the whole season, with slight exceptions, being in the most favorable conditions for performing their office.

As represented in the engraving, they radiate in all directions, no large ones being formed to destroy the balance among the vines or among the members of the same plant.

Plate No. 26 represents a row for the wall-trellis of a Thomery plan, with the trench open, so that the vines may not be buried too deeply during their first summer.

The direction of the row is north-east and south-west, facing the south-east, which is the most favorable aspect. It is not necessary for the success of the plan that it should always bear a south-easterly aspect, but it should be somewhat southerly. An eastern aspect is but little inferior to a southern, and greatly preferable to western. At C is shown the ridge of soil that is to remain during the summer and be put into the trench in the fall to remain. At D, D, D, are represented vines that have made a fine season's growth under good management. At F one is represented early in the season with a shoot that is just ready to be tied to the stake, the other two shoots having been just rubbed off. At B the stocks are seen as they appear immediately after planting, before the buds have begun to push forth. The vines of this row are intended to be treated by bedding, as shown by Plates Nos. 24 and 25. It is not indispensable that the number of beddings shall be three, nor absolutely that there shall be any; but under ordinary circumstances that is the best number, and one is at least always to be advised when permanence is a consideration.

Whether the beddings are one or more the manner of proceeding is the same, filling the long trench in the fall and opening another in the spring, by the measure of its width nearer the wall, of the same depth and width, but which is to remain open during the summer and be filled as before at the end of the season. In the bottom of this trench, and crossing it at right angles, trenches one foot wide are to be made, as deep

as the vertebra or axis of the roots, for the reception of the canes to be bedded. The small trenches are to be filled early in June, and the large trench may be filled in July, if the season should be very warm and dry.

Plate No. 26.

An inspection of Plates 27 and 33 will give a general idea of the principal section of the Thomery system and its capabilities.

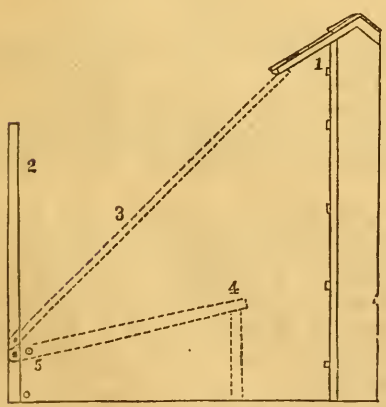


Plate No. 27.

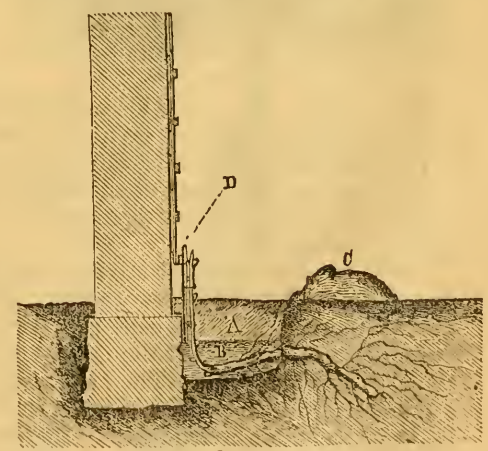


Plate No. 28.

Plate No. 27 is an end view, showing how glass may be used for the two principal rows. Plate No. 28 represents a large layer trained upon the trellis the second season.

The principal section of a full Thomery plan consists of five rows of vines, as it is managed in France, at the place from which it takes its name, and the principal of these rows, which is trained upon a trellis but a few inches in advance of the sheltering wall, consists of five courses, the first being placed from twelve to sixteen inches from the the ground, and the others about eighteen inches apart, above each other, thus occupying a wall about nine feet in hight, allowing for a little waste room under the cap, that

is lost by shade. The stocks are set less than two feet apart, and sometimes less than twenty inches, so that the arms are from three feet and a half to nearly four feet long.

When the box-layers are used, the progress toward establishment may be so hastened, that strong canes may be growing on the principal trellis ready for making arms, the second season from planting, the border being well filled with roots, and the vines in bearing condition.

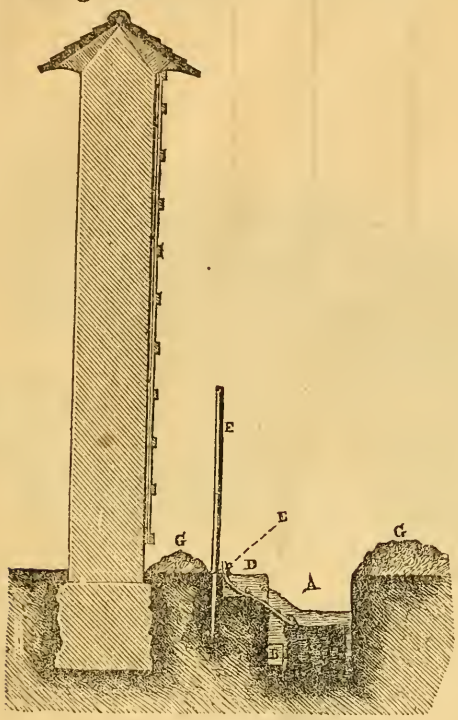


Plate No. 29.

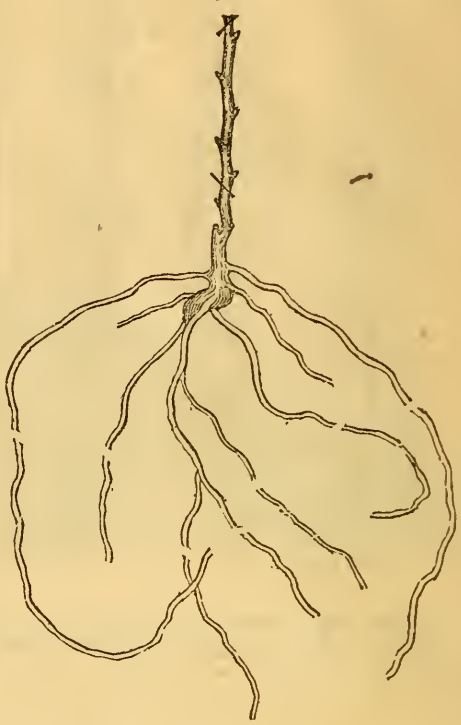


Plate No. 30.

Let a trench two feet wide and twenty inches deep be made in the border, parallel with the wall, and having its nearest side four feet from it.

Into the bottom of the trench put three or four inches of the soil from rich sods, and upon this place the boxes at the regular distances from each other, and so that the point where the canes rise from them will be four feet and six inches from the wall, as represented in Plate No. 29.

Fill in around the box and two inches above it, with the same material that was directed for the bottom of the trench. Set a stake F two feet from the box in the direction of the wall, with the cane pruned and directed toward it obliquely ascending, to be fastened as at E. About the middle of June a cane will be grown from the upper bud, three or four feet long. The last season's cane is now to be turned from its place and a trench to be made, one foot wide, in the direction between the box and the stake, and in depth to within four inches of the bottom of the box.

By the same proceeding, only placing the box one foot nearer the wall, the vine may be placed upon the trellis, the first season bearing three bunches of fruit. Removal of the fruit will hasten the maturity of the vine.

Plate 30 represents an ordinary vine three years old that has not been transplanted or root-pruned. All of the portion of it that can be used in planting is destitute of fibers, and they can never be reproduced except from the ends where the root-pruning is performed at planting, the marks for which are shown. The disadvantage of such vines is obvious. See Box-Layer, Plate No. 31, which is the best possible kind of plant that can be produced. Plate No. 32 represents the best quality of vine of more than one year old produced by transplanting and root-pruning.

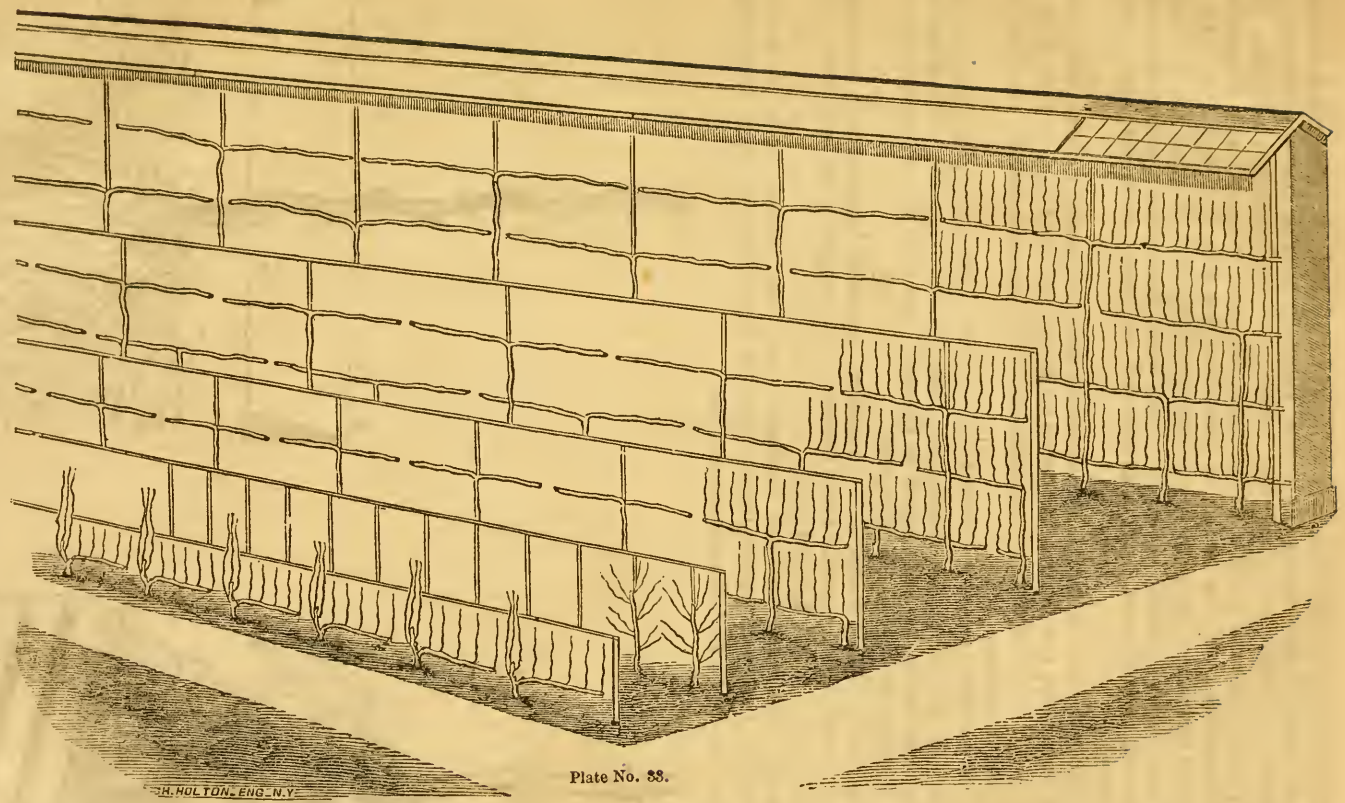


Plate No. 88.

The different grades of vines grown from single eyes are represented by plates Nos. 14–19, inclusive; No. 19 being of the class Extra; No. 18 No. 1; and so on to No. 14, which is No. 4. The class Best Selection will be found represented in another plate. None of lower grade than Extra should be admitted for the Thomery planting, as shown in the annexed plan; for the full exposition of which see LANDMARKS. A border or piece of ground, twenty one by one hundred feet, well planted and managed with Delaware or Iona vines, or both together, will produce a more valuable crop in a given time than a house that will occupy the same extent of ground welll planted and managed with foreign vines. The weight of the crop for a succession of years will be greater, and the quality of the fruit will be even more clearly in favor of the natives. I have known numerous instances of trial of flavor being made by those who have the acquaintance of the best Foreign kinds by habitual free use, and I have not known one instance in which the preference was not accorded to the Delaware.

The trellis on the main wall which should be about nine inches in advance of it, has four stages of vines planted two feet apart in the row. The second has three stages three feet apart, and seven feet in advance of the first. The third consists of two stages, four feet apart. The two other rows may be about three feet apart as seen in the engraving. For the trellises, laths or wires may be used, but the wire is greatly to be preferred. A small section of glass is shown here that may be used for shelter, to be applied Fall and Spring, and figure 27 shows how glass may be used still more efficiently for protection in the beginning and end of the season for the advantages of which see LANDMARKS.

The idea generally prevails, that the system of vines placed above each other in the manner shown on page 22, constitutes the entire Thomery plan of training, whereas, it only constitutes one of the most important members of the principal section. The entire Thomery plan is a vine garden in the form of a parallelogram, the dimensions of which, for illustration, may be stated at two hundred feet in length by fifty in breadth, having its length in an easterly and westerly direction, so that the principal sheltering wall may have a southerly aspect. The most favorable exposure for a cold or temperate latitude is south-east, being that afforded by the wall running nearly north-east and south-west.

The hight of the wall, on the north or northerly side, is generally about nine feet, and in exposed situations, one or two feet more or about two feet higher than that of the ends, while in all cases the wall of the southerly side does not exceed six feet, unless to protect from intrusion.

The principal or northerly wall, and about twenty feet in front of it, are occupied by five rows of vines, as shown in the engraving, Plate No. 33, page 36. The principal row is trained upon a trellis that is fastened to the wall, but from six to nine inches in advance of it; the last distance is not too great.

The remaining thirty feet is occupied by a system of walls less elevated, on which vines are trained, some running parallel and some at right angles to the northerly wall, for a full account of which see LANDMARKS.

The outer walls are called walls of inclosure, and the others walls of shelter, although the walls of inclosure, and especially that on the north, are even more walls of shelter than those which perform no other office.

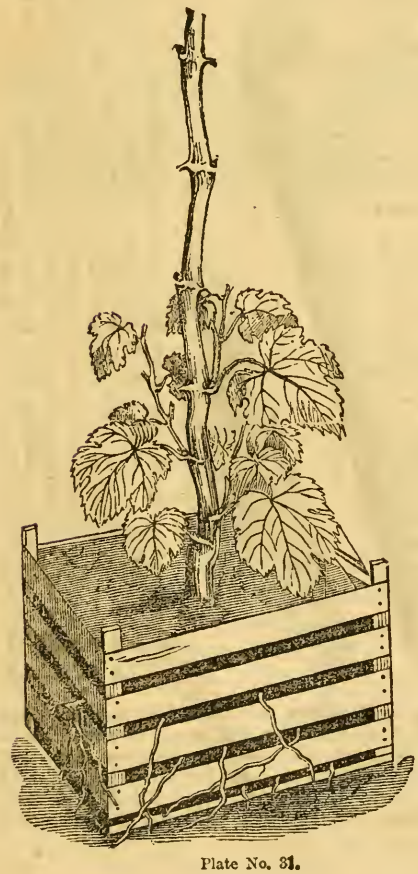


Plate No. 31.

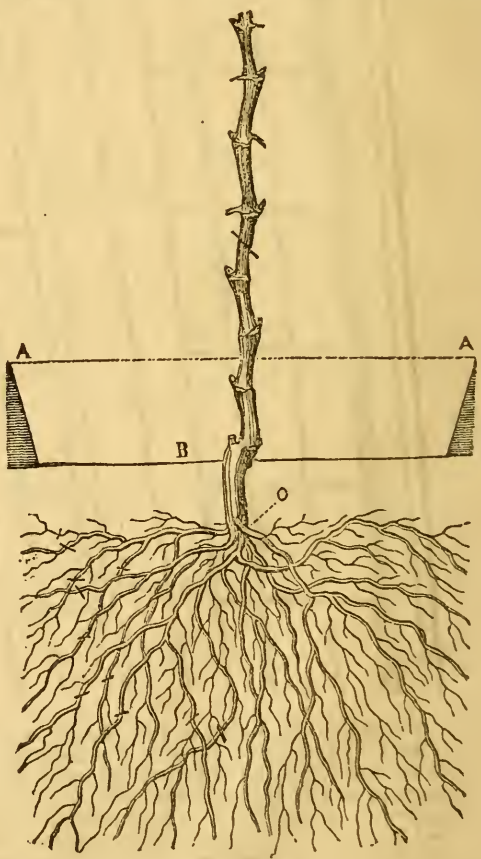


Plate No 32.

A more extensive and thorough plan would be two hundred feet wide, and any greater length desirable, with a northerly wall twelve or fifteen feet high, which would be the proper dimensions for an extensive fruit-garden, the northern wall of which, with its border, would be occupied with vines, and the remaining ground with espaliers and rows of dwarf trees chiefly. Shelter from the north is always advantageous for every horticultural operation, and should be provided for the kitchen-garden not less than for the fruit-garden or for both combined, numerous plans for which will be given in LANDMARKS.

Such a border and trellis as is represented on page 36, well furnished with Delaware and Iona vines, is capable of affording results fully equal to those of a well-managed cold vinery of the same dimensions, for the advantage and enjoyment of a family, and at one tenth the care and expense required by the vinery.

The border is twenty or twenty-one feet wide, and of any desirable length, not less than twenty-five feet, which is the proper width of a span-roofed house.

But for a cold house the border should be at least eight feet wider than the structure on each side, for the most convenient and advantageous management.

This collective trellis will afford many feet more of bearing area than can be had from a house of the same dimensions of ground measurement, and the same time nearly will be required to bring each into full bearing.

But by the use of suitable plants, the trellis will yield a valuable amount of fruit immediately, and will be greatly in general advance of the ordinary progress of a house in productiveness.

When the greatest degree of permanence is required, the vines on the principal trellis require from four to six years to place them in full bearing, although they will give a large amount of fruit after the second year. The other trellises require respectively one and two years less time, and as little as any mode that can be adopted. For immediate and permanent results, there is no method that can surpass or equal this in the fruit-garden.

Shelter in spring and fall, with protection from tempests and tearing winds, which sometimes cause damage in summer, is one of the provisions that are required to make the greatest degree of certainty in the perfection of ripening wherever the grape is grown, but especially toward the northern limit of its cultivation.

Instead of taking the vines to the wall, and making full protection for them there, as shown in Plates 27 and 33, I devised a simple plan for placing the shelter by the vines as they might stand in the garden, and at the same time arranged the planting and training so that they might be easily laid down and covered in winter, which is advantageous to vines where it is not absolutely required, increasing the earliness, quantity, and quality of the produce.

Plate 34 shows the detail of the plan by which the whole is to be accomplished.

The planting, bedding, and training are the same as for ordinary vineyard management, except that the arms, for convenience in covering, may be made a little lower than consistent with entire avoidance of spattering of the fruit without a little protection. At Fig. 1 the vine is seen from the south, with the shelter in place, immediately after uncovering the vines in the spring, the farther side of the shelter resting on the ridge of soil that covered the vine during the winter. A section of the ridge is shown at Fig. 4, where the shelter is seen from the northerly side. The shelter may be most cheaply made of thin boards, but will be much better made of glass.

At Fig. 2 is seen a vine representing two canes in bearing, which will be referred to when treating of training. When the shelters are made of glass or boards they may be set upright on the northerly side of the vines, and afford the protection of a wall during the season, greatly to the advantage of the vines and fruit. At Fig. 5 is seen a ridge covering the vines in winter, the end being a section discovering the stock of one of the vines.

The shelters are placed under cover during the winter. The construction and manner of using will be fully given in LANDMARKS. The drawings were made for illustrat-

ing a course of Horticultural Lectures in New-Haven, in February, 1860. In the month of June following I received from France the excellent work of Dr. Guyot, in which something of the same plan is wrought out in full detail, under the elaborating care of many years.

He does not restrict the use to the north merely, but recommends it for any locality where grapes may be cultivated, saying, "that in the most favorable climate it not only adds greatly to the value of any crop beyond the cost of application, but renders the production of a full crop of grapes as sure as anything can be that is in the least degree short of absolute certainty."

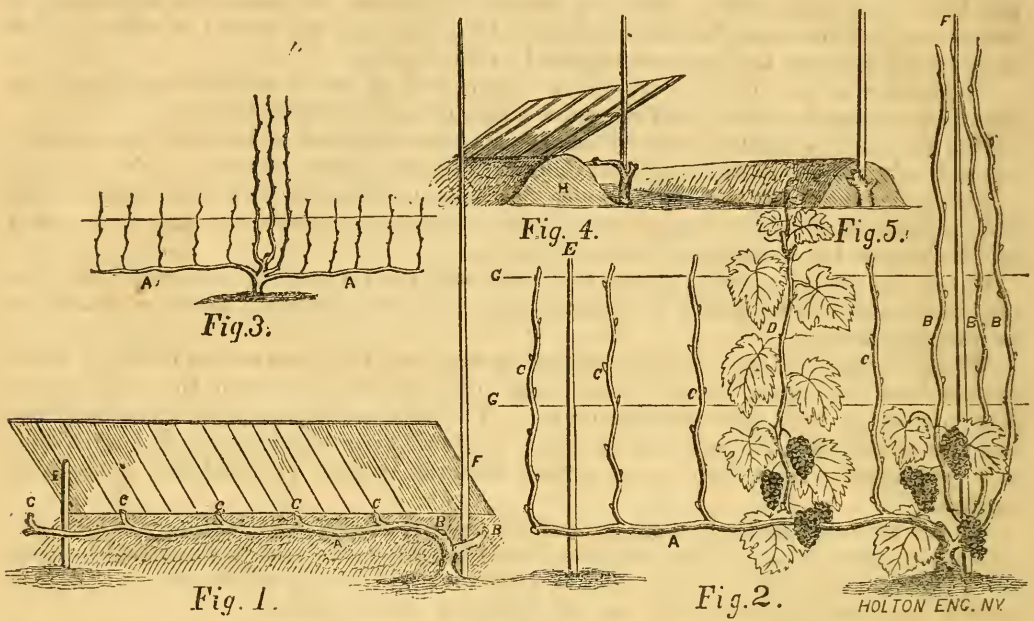


Plate No. 34.

When vines have been planted six or eight feet apart, and have become confused without system, and are yet thought to be too valuable to throw away, the question is often asked: "What is to be done?" Plate No. 35 shows one of the best methods of bringing such vines into such some degree of order.

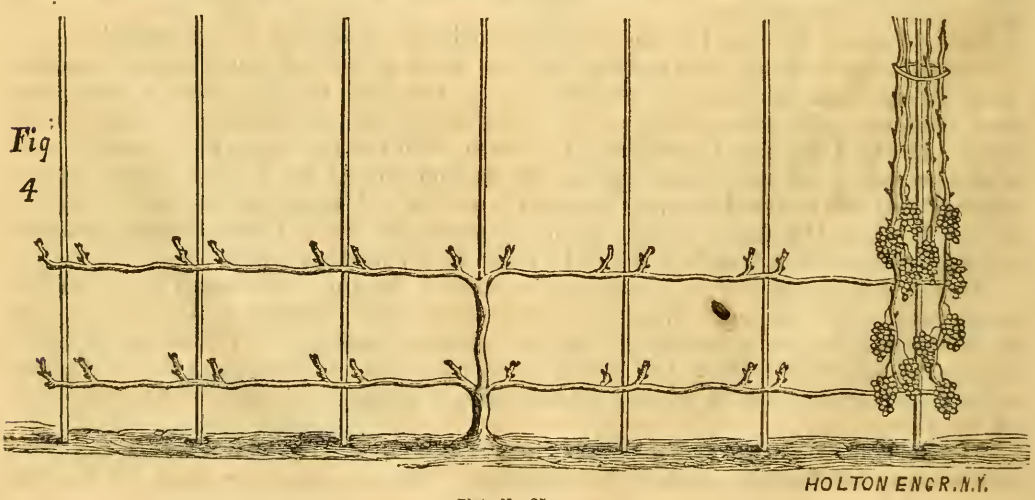


Plate No. 35.

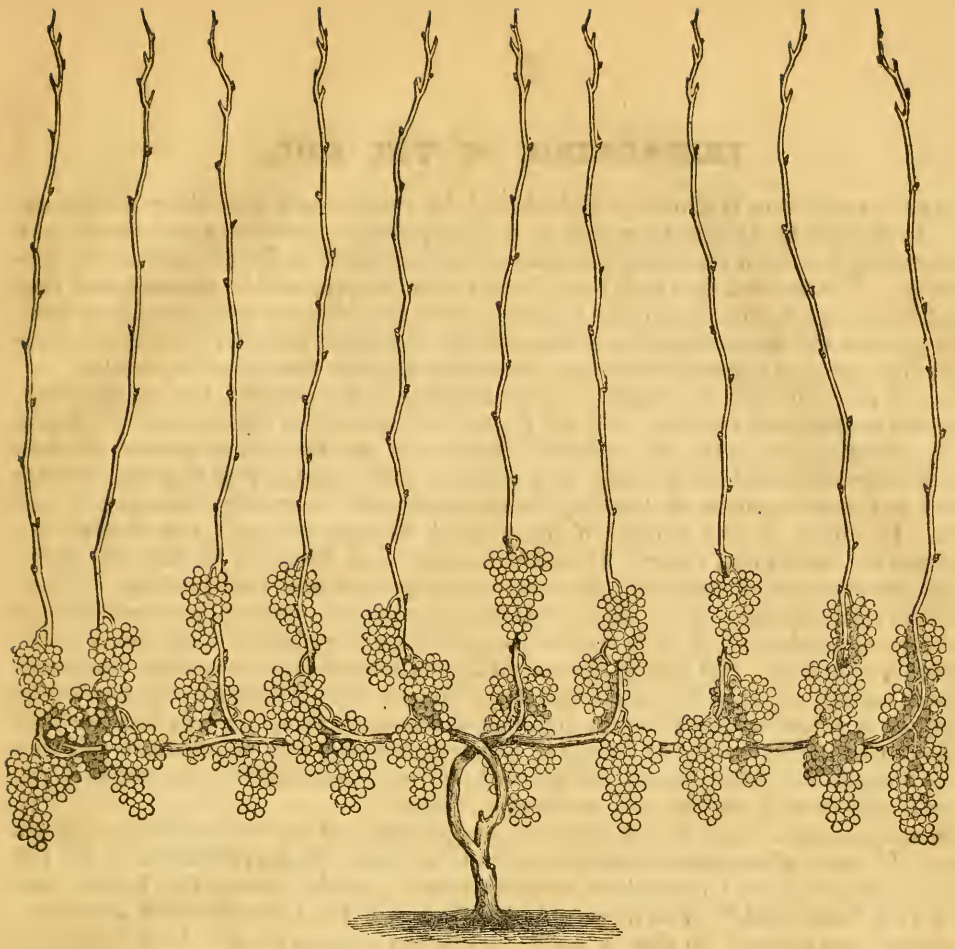


Fig. 36.

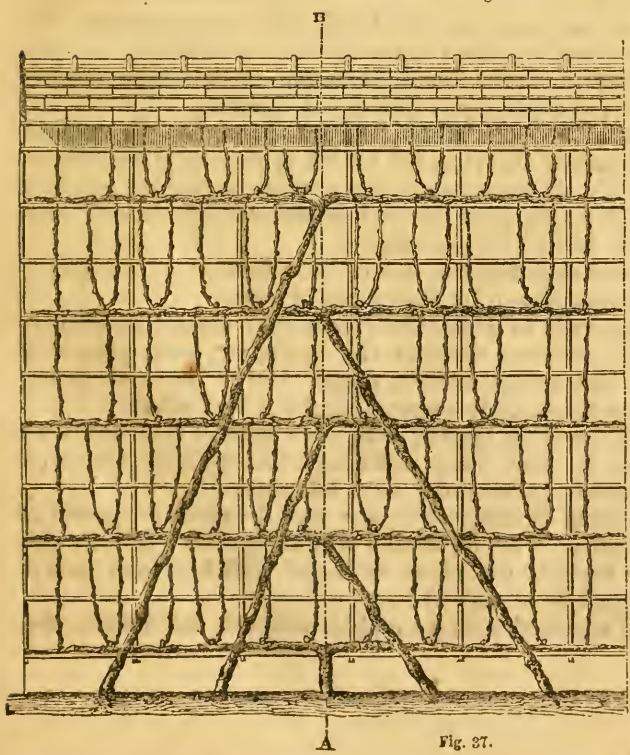


Fig. 37.

In the last plan, Plate No. 35, the rule, to take all of the bearing canes of every vine from the same level, is violated, but not so damagingly as in the ordinary fan method, and is suited to distances of eight or ten feet each way.

The next example, Plate No. 36, is well adapted for distances of from four to six feet in the rows, with the rows four feet apart; three feet being the length of the bearing canes.

The plan shown in Plate No. 37 is very valuable for covering a wall ten or twelve feet high, and about twelve feet wide; such as are often found in city yards. The distances are two feet, and the width of border requires from eight to ten feet. Vines specially grown for the plan with long canes, will clothe the wall with beauty and considerable fruit the second season, and with an abundant crop the fourth from planting.

PREPARATION OF THE SOIL.

AFTER the situation is chosen, which should be such as will give the vine full exposure to the sun for the greatest part of the day, always preferring an easterly to a westerly variation from a southerly aspect, the accommodation for roots demands consideration. The ground in which it is planted must be prepared to give safe and convenient lodgment, both summer and winter, as well as to furnish a *due* supply of food.

The greatest evil to be feared in summer is the lodgment of water in the soil occupied by the roots, or excessive wetness; excessive dryness must also be avoided.

The evil to be dreaded in winter, is *severe* freezing of the ground, but chiefly alternation of freezing and thawing, and *all* freezing of roots that are not well protected from the direct action of the atmosphere. Roots that are six inches beneath the surface will bear uninjured the freezing of a severe winter, but the vine that has its roots exposed to the atmosphere at freezing temperature will be greatly damaged, if not ruined. In spring, as the surface of the ground becomes warmed, the roots of the vine shoot out with great vigor. The surface-roots seem disposed to take all of the labor of supplying and sustaining the vine in its growth and fruit-bearing. While the heat is moderate and the surface continues moist, the early vigor continues or even becomes accelerated if, with increasing temperature, sufficient moisture is uninterruptedly supplied. But before the end of June the surface must become less moist and more rapidly so, than the roots can be prepared for. The vine ceases to make new leaves of large size, and fails to give the substance to those already formed, that will make them effective and enduring in bringing forward the young fruit and furnishing fine-grained, hard, short-jointed wood, which is necessary for the building up and continuation of a healthy and productive "stock."

The surface-roots cease to act, the vine languishes, and various marks of illness appear. In cases of extreme severity the fruit fails and the leaves shrivel. In the Isabella, both shoots and fruit show numerous dark purple specks, the leaves turn brown with "sun-scald." The more enduring leaves of the Catawba show less disorder, but it drops its fruit, so that a large part of the crop, with all of its beauty, is often lost by "the rot."

In mild cases the vine comes to an apparent stand-still, but only apparent. No new leaves are formed, but those already formed increase their substance. As the surface-roots cease to act the lower ones take increased action, and if circumstances are favorable, the fruit again begins to enlarge and goes on to ripening.

These surface-roots will be destroyed by the winter, and when they have grown so large as to become an important part of the vine, its health is destroyed with them. Often no marked effect follows, while all circumstances continue favorable; but it is only the vine whose health is at all points guarded and whose strength is ever husbanded that is able to withstand all trials of the seasons.

Nearly the same train of symptoms follows the loss of the roots or the hindrance of their formation during the growing season by the excess of water.

We have glanced at a few of the evils to which the vine is very often subjected, in order that we may see the need of obviating them at the beginning, or in preparing the ground, so that it may easily and successfully be done. But if not done before planting, it can never be more than imperfectly accomplished by after efforts.

Our indications then, are a deep pervious border, with open subsoil that needs no draining; or if subsoil is retentive, it must have sufficient inclination to admit of drainage. If drainage is not practicable, the border must be raised.

To obviate the evils that result from drouth, the border must be made deep, and of material that is attractive of moisture. This indication will always be perfectly fulfilled in making the home for the roots of the plant so stored with food and that of suitable quality and quantity as shall be always at hand.

A border of proper depth, well enriched with a suitable compost, *can never be dry*.

Its attractive power increases with increase of temperature, so that in hottest weather it will best supply the food that the plants need. We are not to suppose the material of the border is food ready prepared for the plants, but rather that it is the unwasting material from which such a daily supply is cooked, as the little stomata may need, and not in wastful proportions, but that the want and supply are greatly increased by increase of temperature, as also ability to appropriate, or, in other words, to effect growth and fruitfulness.

To make a border that will give results most abundantly satisfactory, no learned compound is needed, but just such a soil as will give the best crop of corn or wheat, but deeper by two or three fold, will be all that is desired for a grape border or vineyard. How best to effect this, depends upon a great variety of circumstances, at which we can scarcely glance for the present. Where stable manure is cheap and abundant, the grand specific is revealed. But generally where grapes in the garden especially are most desired, it is scarce and dear. Of the compost-heap we shall speak soon; for in all gardening operations it may be looked upon as a convenience so great that it may be considered indispensable.

We shall, for the present, assume the position as undisputed, that the border must be deep and well enriched, and also that its component parts must be thoroughly worked together into one homogeneous mass. But the terms "deep" and "rich" convey no very definite idea, and with propriety, vary according to circumstances. A depth of eighteen inches of well-prepared soil may, under one state of things, be quite sufficient, while another set of circumstances may require at least three feet. We will consider these the maximum and minimum, remarking that the depth may be almost as damagingly too great as too little. Towards the northern limit of the vine-growing region, success depends upon making the most of a season rather too short and temperature inconveniently low, and the full measure of success there obtainable, under every appliance and care, will not generally quite equal the ordinary *good* results which are easily obtainable in the most favorable latitude. To make the most of the spring the roots must be kept as near the surface as practicable, and consistent with their maintenance in healthful productiveness, and the ripening of both wood and fruit in early autumn is considerably hastened by having the fertility of its border of moderate depth and the drainage most thorough and effective.

With what appliances and under what circumstances these co-workers with nature, under difficulties, may best succeed, we shall soon attempt to show; and with no small degree of pleasure, for to these her most earnest and devoted lovers, we are indebted for much of the knowledge of our art. Eminent success in horticulture, and more especially in viticulture, depends upon such a degree of knowledge as can be attained only in a "rather unfavorable climate and tolerably barren soil," and the way to success has been marked with such clear lines of light, that it is not difficult to follow; and although the fruits of the soil will generously reward the labor, a far more valuable compensation will result in the development and cultivation of the man whose powers will be called into healthful and invigorating exercise in the way of charity and benevolence.

The preparation of the border may be effected in a variety of ways, according to circumstances, and the end to be accomplished.

1st. To prepare one of eighteen inches in depth. This may be done by "trenching" with a spade; and to commence it, a trench of about eighteen inches in depth, and the same width is made; if the subsoil is gravelly, and not retentive of water, the top soil of the adjoining eighteen inches may be thrown into the bottom of the trench, constantly mingling a little manure with it as it is pulverized and thrown in, omitting what is technically called drainage. If the subsoil is retentive, but the ground has some degree of inclination, loosening the subsoil with a pick will generally afford sufficient drainage unless there is an extraordinary supply of water which must be disposed of. We will suppose the fertile soil has a depth of one foot. There will then be half a foot of unfertile subsoil to be put upon the top and made fertile by manure, or be

taken away and fertile soil substituted. To make the border ready immediately, the latter is the course to pursue. The addition may be made of rich, partially decomposed sods from pasture, roadside, or meadow. A good way to prepare these in quantity is to turn over with a plow and leave for a few weeks to decompose. A better way is, after they have been turned over until the grass is killed, to break up coarsely and form into heaps of about two feet in thickness, with the addition of some stable manure at least considerably rotted if the soil is for immediate use. While lying in this condition a thorough wetting, either by rain or otherwise, will be very advantageous. This may be used to fill up the remaining six inches of the trench, but better to place it at the bottom and the garden soil upon the top. The sods, if only wanted in small quantities, may be cut with a spade, and may also be used immediately by placing grass side down in the trench, using manure or compost as may be required. Which is the better course for the vines is obvious. If the sods are taken with the spade, it will be well to loosen the ground first with a pick that they may be partially broken, which will favor rapid decomposition.

A good border may be most simply made by the addition of half a foot of rich, well-pulverized soil—the first foot being previously well worked over with plow or spade—manure being spread upon it before the working according to need. In passing, it may be remarked, that the best soil for all additions and amendments, is that made from broken and decomposed sods, or into which they largely enter.

In a well-prepared border of the above depth, if the soil is pretty fine and rather compact by nature, vines will do well for a great number of years. After they begin to give fruit, an autumnal dressing of manure very lightly worked in before winter, and again worked to the depth of four or five inches in early spring, will keep the ground in constant fertility.

By the same process a border of two feet in depth may be made, or even two feet and a half. The addition of the foot will more than double the expense, but in this latitude, and under favorable circumstances, will be judicious and profitable. And if made to the depth of three feet, where permanence and best results are a leading consideration, the additional cost will never be regretted.

A grave error often occurs in the preparation of borders where deep working with its object is not well understood. The fertile soil, with or without manure, is sometimes put to a great depth below the surface, with a great thickness of unfertile soil above. This is much worse than useless expenditure of care and means. Soil should never be made deeper than can be well "aërated," and its fertility should commence at least from *near* the surface, unless the surface consists of very open sand or gravel, of which a covering for a border is sometimes advantageously made.

When very deep working is proposed, that is to say, deeper than three feet, a preparatory step is required. Soil, or rather a mixture of earth and manures to serve as soil, or a receptacle for the root of plants, can not undergo the necessary changes to fit it for entertaining them at a great depth below a compact surface. This preparation must be previously made by repeated workings and aërations before it is put below. We often hear of ground being worked to the depth of five feet. To do this well is no doubt *possible*, but not *easily* practicable. We will consider a depth of four feet only: As a preparatory step, at least two feet thickness of good soil must be so well prepared as to be fitted to go below two other feet of soil, and to give food and entertainment to the roots of plants with no other atmospheric and upper-region influence than can be, we suppose, very sparingly communicated through the superincumbent mass. We think the question may, with propriety, arise, whether this depth of soil may even *remain* in a wholesome condition, except in extremely coarse and open formations, or for the entertainment of very insensitive growers, like some of the gigantic forest trees. The upper two feet, or that which by reversement has become so, must be treated as so much barren soil, and will require at least a period of two years to bring it into perfect condition. In case of a very coarse and open soil, even for the vine, we can suppose such preparation may be called for and judicious·

but not under ordinary circumstances, or such as we are at present called upon to consider.

For ordinary garden culture, the depth of eighteen inches, that we have chiefly spoken of as the least that will enable a border to give good results, may be safely relied upon for at least twelve years, and without much deterioration for twice that period. This supposes the ground from the first to be given entirely to the vines; grass, weeds, or other plants having no occupancy there. But for the Thomery plan, which combines the excellence of all systems, the most thorough preparation of the border should be made, and the depth should be from two to three feet; its width from ten to twelve. This width may be divided into belts of four feet each, and be prepared at intervals of one year or more. As it is supposed in all cases to have a southerly aspect, (varying southerly or westerly as may be required,) the most southerly belt should be first prepared, and in the center of this we plant the vines as we shall hereafter see, adding each belt as may be needed, which we shall hereafter more fully explain when considering the planting of the vine. (See page 37, Plate 7.)

In the preparation of this border no new principles obtain, but the particular importance of thorough preparation of the border for this plan of training arises from the *permanence* of the "institution" which we aim to build, as well as from the excellence in quality and quantity of its produce. We begin to gather enjoyment from it in the shape of delicious fruit as soon as from any other plan, but can not expect to realize the full measure of its bounty in less than six years from the time of planting. We wish it to be clearly understood that the Thomery plan is not to be urged for all planting, and irrespective of circumstances, but under proper circumstances, as the best method of employing extraordinary means for the accomplishment of great results. We dwell particularly upon this plan, with a profusion of illustrations, because the person who masters its details with a clear knowledge of the wherefore of the performance of all of the operations, from the planting to full establishment in bearing, has not only become acquainted with the principles of all grape culture, but has a general knowledge of the object of all *training*, as practiced in every department of fruit culture.

When we come to look at training more in detail, we shall see that our general principles are to be carried out under a great variety of modifications, according to circumstances, of room, exposure, climate, etc.

We have now treated of the preparation of the ground for the garden, or in such confined space as only admits of the employment of man-power. In the field a very great saving of labor may be made by the employment of teams; and for this purpose very strong ox-teams are the best. These, to do the work perfectly, must be largely assisted by the shovel.

We will suppose we are to operate upon a field whose soil presents no insuperable obstructions to working a depth of two feet. If it is in sod, this must first be turned over and rotted. Manuring will probably be required, and this should be spread upon the furrows before the next operation. Our next operation will be simple trench-plowing, by which we aim to get a soil of eighteen inches in depth, but will be likely to achieve not more than sixteen inches. It is done by going a second time in every furrow; and if it is plowed in "lands," so that ridges and dead furrows result, it must be turned back by a simple plowing before the next operation, which will be "compound trench-plowing." This is done by plowing through and going back empty, or taking a furrow one way and going back with the plow on the surface, turning the furrows all one way. This time the plow is to go at least three times in every furrow, followed by men with long-handled shovels to throw up the ground that is loosened by the plow, for loosening is all that the plow can do at that depth. If by the first operation of trench-plowing a depth of eighteen inches was gained, it will not be too difficult by this operation to make the whole depth twenty-four inches, which, so far as deepening is concerned, in a soil of medium tenacity, may be considered first-rate preparation. We shall here have six inches of unfertile sub-soil

atop. Into this should be worked at least twenty-five cords per acre of compost, consisting of at least fifty per cent stable manure. The most complete preparation would be seventy-five or eighty cords per acre of good surface soil from an adjoining field, with half or all of the compost before named. If this addition of soil is made, the previous working may have a proportionate diminution of depth.

When ground receives such addition, it is advantageous often to have the added soil of a different character. If the original field is too compact, add such as is more sandy and open, or the contrary, or a large amount of leaf-mold, vegetable decay, or muck. The practical cultivator needs no direction to bear in mind our intention of getting a good corn soil of at least double the ordinary depth, that is to say, at least eighteen inches, which may be considered very good. In all of this, we have had in mind growing grapes for the table, for which large bunches as well as large crops, and beautiful in appearance, are such a desideratum as to be regarded indispensable to profit. Luscious grapes of best quality for table use are not necessarily best for wine. *High* flavor is always required for making good wine, but not necessarily the delicacy that constitutes a great element of excellence for the dessert. Among foreign varieties, the Chasselas may be considered excellent for eating, but quite worthless for wine; the Frontignans, most excellent for wine, and *far better for dessert* than the Chasselas; but the Frontignans may be so grown by excessive enrichment, as to give only poor wine, yet still the highest satisfaction for the table.

Tastes, whose powers of discrimination have been well trained, and subjected to comparison by good standards, can speak confidently of the ability of a grape to make *good* wine, but the ability to make *excellent*, or *most excellent*, can be learned only by actual experiment. And it must be borne in mind that the perception to take cognizance of the best wine, or the ability to take particular enjoyment from it, are neither of rapid growth nor the result of little practical knowledge. The palate performs only the porter's or janitor's office, which is merely to judge of and admit such applicants as the lord of the mansion shall find fit guests, and should be, of course, always acting in subjection to his lordship's commands. If the mean and trivial are allowed to get possession, the mansion will be debased. If such as bring strength, elevation, and inspiration, it will be ennobled.

The subject of wines is one that can not be profitably engaged upon with a little preparatory knowledge, and we will not proceed with it at present.

The preparation of a vineyard for the production of the best of wine should be as carefully and as thoroughly done as for the production of fruit for the table; but for this purpose so large crops are not supposed to be obtainable with due regard to quality. The ground must be at least as deeply worked, and a sufficient degree of enrichment evenly diffused through the soil, which the roots are to occupy to maintain a good degree of vigor and productiveness. Superficial working of the ground as a preparation, and mulching with weeds, we may admit in a general way to be both new and strange in theory, but every one who is at all conversant with vine-growing, knows that it is not only very old, but that it has always proved very disastrous in practice. That those who are ill-naturedly called nostrum-venders, are able with much certainty to pour health directly into a diseased man, we may not be quite ready to allow; but we can not, on the first view of the matter, positively deny it, for his conformation does not much violence to the idea, particularly when his head is thrown back, and his mouth wide open with wonder; but that plants which have never by any lapse acquired a false appetite, should take with avidity and advantage that whose touch destroys their tender mouths, we are not ready to believe on any evidence that has yet been offered. Nor does a pretty extended observation in connection with numerous experiments, afford any ground for faith in "specifics," except such as may go into this compost-heap for its reduction, and lose their specific character before coming in contact with the roots of plants.

INTRODUCTORY REMARKS ON TRAINING.

In order to make the subject easily intelligible it is necessary to have some knowledge of the purposes to be accomplished by it at the beginning. All good systems or methods have the same objects in view, and endeavor to attain them through the application of the same principles. But there is a great variety of methods of application to accomplish the same general plan, and these are varied by different circumstances and conditions.

The vine is a savage, and however long time it may have been subjected to civilization, like humanity, it never learns to become all that is desirable without education and training under favorable conditions, which it is the object of the garden to furnish for all of its inhabitants.

The sportiveness of the savage, that tends to little but luxurious enjoyment and the propagation of its kind, in the warm latitudes for which it is specially adapted, must not only be led in the daily walks of duty and sobriety, but must be induced to perform these duties in a somewhat, at least, uncongenial climate. Its nature must be humored and led, but can not be crossed or very greatly constrained; and we have acquired such knowledge of its character that we know the conditions under which some of its varieties will thrive and yield their delights perpetually.

At the time of planting, as we have already seen, the system of education and training by which it is brought to mature productiveness is already contemplated and decided upon.

A space of certain dimensions in breadth and hight is to be occupied by a mother-stock of given size and proportions, to be furnished with a precisely defined number of canes, each one of which is to be garnished with a certain definite number of buds, leaves, and bunches of fruit, all of them disposed in predetermined order. To bring the vine through its infancy and youth to full maturity is very easy, but to maintain it in full vigorous manhood of productiveness perpetually, requires more attentive consideration. "The child is father of the man," and if every step upward is well taken, the conditions of its manhood are favorable to perpetual health and existence.

The ordinary difficulties that occur in training are from the disposition of the vine continually to extend itself, and particularly upward, which must be restrained within the prescribed limits. The upward tendency is easily controlled by taking all of the bearing canes of the same vine from the same level; and when a great elevation is to be covered, like a high trellis or wall, or the side of a building, the different stages of elevation are to be covered with different vines, as we have seen already in the Thomery plan, pages 22 and 24, and also 25. Those will be more fully understood after reading the chapter on training which follows, in which the principles of training will be fully developed. The same may be said of the chapter on pages 39 and 40. A number of plans will be found for taking fruit at different points of elevation on the same vine, as in Plates 2, 3, 4, 5, 35, 43, 50, etc.; but these are all imperfect and wanting in permanence, but may still be advisable under some circumstances.

TRAINING THE VINE.

On the subject of planting I have given such full and particular directions, that all who have read the remarks with attention can not fail to have acquired correct general ideas of the true theory and practice of training.

The subject has been so fully illustrated with engravings, which exhibit the methods of training also, for which each plan of planting is peculiarly adapted, that the student must, at the same time, have acquired a pretty good idea of training, so that the matter will be easily understood if treated in the plain and simple manner that belongs to operations the most simple and naturally concurrent with common-sense of any that fall under the cognizance of horticulture.

All that is required of the student is to begin at the beginning and look clearly at the manner of performing each operation, and the wherefore of it, as it will be stated. In one hour the difficulties which have been attributed to the subject will all be dissipated forever.

But let the student who wishes to learn, first lay aside all preconceived ideas, and at the same time avoid substituting any theories of his own until mine are fairly understood from the beginning to the end of the chapter. There is not any doubt or obscurity belonging to the subject, and any man or woman, who will follow me with undivided attention, will be able to manage vines according to any good system successfully and pleasantly.

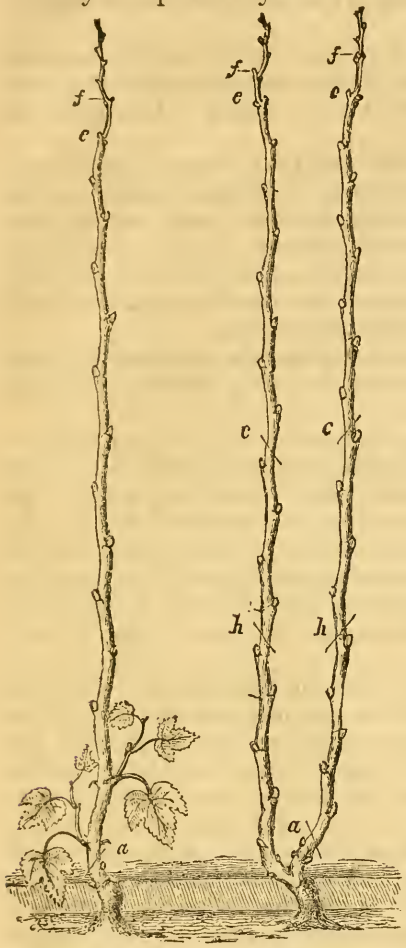


Plate No. 44. Plate No. 45.

Here are engravings drawn from two living plants, by which I shall be able to point out and explain, as clearly as from the actual vine, all of the operations required in pruning and training during the two or three first years of their growing in garden or vineyard. The vines appear to stand on the south side of a trench about two feet wide, and eight or twelve inches deep. Of the object of that I will not now speak, as it has nothing directly to do with my present purpose, but its object will clearly appear when I come to treat of layering, both for the production of plants and for strengthening those already planted.

At Plate 44 is seen a vine that has made its first strong bearing cane, or perhaps that has borne its first two or three bunches under proper management. This has actually borne two bunches, and the vestiges of the stems from which they were taken may be seen opposite the two laterals which are represented. The stock from which it grew was pruned to two buds, both of which shot forth in the spring, but as soon as the lower one had made sufficient length and firmness to admit of its being tied to the stake which was set for its support, (but not represented in the plate,) the upper shoot was rubbed off, and soon after the last season's wood was cut, just above the lower cane, so that the season's growth has partially covered the scar, and next year it will be nearly obliterated. As it grew, leaves were formed at every joint, and at the base of every leaf (in its axil or armpit) were formed two buds; one (called the *anticipative*) immediately pushed forth into a shoot, (called a *lateral*,) and the other remaining dormant waits for the spring to send forth a shoot that will form a cane to be garnished with fruit if the vine is of fruit-bearing age.

The "laterals" are sometimes called "secondary shoots," as well as "anticipative." These, on any vigorous vine, will sometimes put forth a secondary crop, if they are not "stopped," which will rarely ripen, and is never valuable.

When the laterals have made three or four leaves, they should be pinched off so as to leave only the lower or first leaf, as seen in the engraving. The bud at the base of this leaf will soon push forth and need stopping, as before, at one leaf above or beyond the former stopping. Thus, in addition to the primary leaf we have two secondary leaves, and before the end of July there will be on young vines probably four secondary leaves resulting from as many stoppings. After the last of July, in the vineyard, the laterals may be suffered to grow on undisturbed to the end of the season. If the plants are growing in nursery, and especially layers, they should have the laterals stopped until the first of September. At that time the main cane should be stopped, as at *e*, and when it shoots out again, after making four or five leaves it should be again stopped, as at *f*. This stopping of the main cane not

only hastens the maturity of the wood, but enlarges the leaves and wood of the shoot below, without taking perceptibly from its general vigor. If the stopping of the main cane is done too early, or is made too short, the shoots for next season will immediately put forth, and an autumnal crop will be produced. For instance, if, after the vine had grown to *e*, or beyond it, it were pinched off at half its hight, its dormant buds (those for next season) would immediately shoot, and if the vine is of bearing size, flowers and fruit will soon follow. And in stopping the laterals, if one leaf and the bud which it embraces are not left to shoot again, the primary or dormant bud will shoot. On the other hand, if the laterals are suffered to grow on at will without any suppression, they will not only take the sap that should go to the nourishment and development of the primary buds for next season's operations, but would divide the strength of the main cane among themselves, so that no good strong cane or bearing wood could be formed. Only two laterals are shown in the engraving, and those only twice stopped, but one must be supposed at every bud with its primary leaf, and all of them stopped as many times as required, according to the rules above given.

In training and developing this cane or stock we have been equally cultivating and fostering the root, and without a well-developed and well-ripened cane of hard, close wood, we can not have good roots; hence the erroneous assertions that we often hear made—ignorantly, I will charitably believe—that "although the top is feeble or unripe, its roots are fine." Every good cultivator knows that they must, from their mutual dependence, keep equal step, and that unripe root is no more useful than unripe wood. Those who affirm that young vines that are suffered to trail on the ground for want of tying up to stakes are not damaged by the injuries which the leaves sustain in consequence, either speak ignorantly or dishonestly. The proof of this has been furnished by innumerable trials, all showing the vast superiority of the staked vines.

After the planter has got a symmetric and well-developed cane, he can easily draw the horoscope of his vine; and if he has secured this from a young vine the first season after planting, he has passed the point of danger with it in perfect health, and with proper care, his onward course with it will be safe and prosperous—if he does not yield to the temptation to overcrop. If he were to cut this at four buds or at six buds, he might the next season have four or six canes, and twelve or eighteen bunches of grapes. Or if his plant were a strong layer, the first season, instead of the two bunches which we have taken with safety, it might have been pruned to three eyes, and (all of them being suffered to grow) nine bunches might have been taken. Under the best of treatment and with the best of vines, this has been often done, the vines continuing to thrive, and three fold their crops each year. It must be borne in mind in the first place, that extreme productiveness and extreme excellence of quality are at all times opposed, in every kind of fruit, and this is more especially noticeable in the grape than in any other. It is also opposed to size of bunch and berry alternately, but often when only moderate in degree, not immediately. Often the bunches of excessive crops, for even two years, attain a great size, but fail of acquiring full ripeness and flavor. But excessive productiveness is always opposed to the health and durability of the vines; and on this consideration, the course of prudence is of the utmost importance, as will be clearly taught in the course of the chapter.

If it is desired to keep the vine as low as possible, cut the last season's cane (or stock, for such it has now become) in pruning, if it is done in February, so that two buds shall be left above at *a*, where the mark for cutting later is seen. The second or third bud above will start earlier and more strongly, and the cane produced from either of these will be, perhaps, a little stronger at the end of the season than from one of the lower and smaller eyes. If "opposite canes" are to be taken, as shown in Plate No. 45, it must be done from the eyes that are seen below *a*. The object to be gained by cutting at two buds above the place from which the shoots are to be taken at the February pruning, is to secure the safety of those buds. By cutting immediately above them at this season, their life might be endangered, and at least their strength would be impaired, in consequence of the wood drying back after

the operation, nearly or quite to the buds, or so as to involve the buds. At the time of starting, or shortly after, the upper buds are rubbed off and the excess of wood is cut off in June. It is safe to retain one of the upper buds until the lower ones or those to be retained have made shoots long enough to be secured to a stake.

We must now look a little backward, and see what the state of the vine really is. If the plant was feeble, or its entertainment has been unsuitable or negligent, we may be three years in getting such a shoot as the engraving represents. To get the shoots of sufficient strength, we must, in such a case, cut at *a*, and take only one shoot, and under ordinary circumstances, where the ordinary want of care has obtained, the third season often finds the vine only just large enough for our next proceeding. Such being the case, we can not promise to ourselves nearly so good or safe results as when gained at the end of the first season, or not later than the second.

I will suppose the two shoots to have grown prosperously through the season under the same management as has been detailed for the single cane of Fig. 44, and that the time of pruning is at hand—middle of February. We may now cut off the last year's canes at *c c*, (Plate 45,) and have two *canes*, of about two feet each, which we may lay down horizontally, and call them arms. The buds from the lower side may be rubbed off, and those from the upper side, or nearest the upper side, suffered to shoot. These shoots, four on each arm, should be trained upright by means of a trellis or stakes, and may be suffered to bear three bunches each, or twenty-four in all.

Besides the eight shoots spoken of, at the end of each arm, and perhaps from the under side, will spring two other shoots, (the buds may be seen near *c c*,) which also may be suffered to bear three bunches each. These are to lay down horizontally at the end of the season—or rather, at the beginning of the next, to continue these arms until they shall become four feet long, or of the desired length. If the canes for the arms should be of only moderate strength, the cutting may be at *h h*, and then only three shoots for new bearing canes or coursons will be taken from each arm, and a corresponding quantity of fruit. To improve the quality, only two bunches may be taken from each cane, and this is applicable to all cases.

To prune Plate No. 45 for one of the best vineyard systems, cut at *a* and *h*. At *a* will be formed the spur from which two shoots will spring that are to be trained up to the hight of the canes, as now seen in Fig. 50. The next season the spur is to have three canes. The arm will be formed by the cane, which the first season may carry four canes, and the next season two or three more may be added, when the vine will be established in full bearing. The shoots from the arm are to be stopped at four or five leaves beyond the upper bunch. This is the oldest system of which we have any knowledge, and is, under some circumstances, the best yet known, particularly where fine, strong plants are used, and the ground is well prepared.

When plants of inferior quality are used, a system of layering must be employed which has been already referred to.

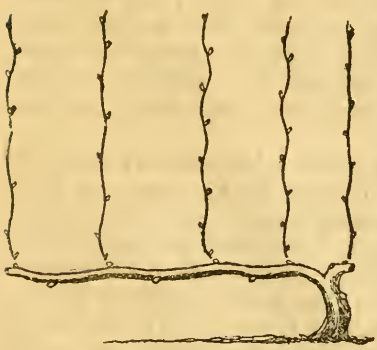


Plate No. 46.

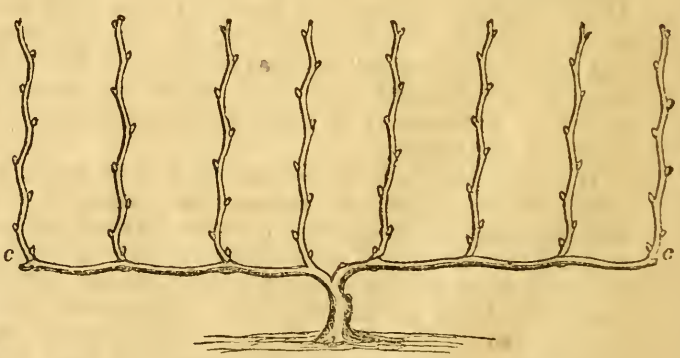


Plate No. 47.

If the vine is very strong and well grown—and for simplicity we will assume it to be so—the cut may be made at *c* instead of at *h* for the cane which is to form the arm

from which four bearing canes will spring from four buds which are to be retained for the purpose. At *a*, on a short spur, may be seen two buds, only the upper one of which will be retained to form a shoot. The lower bud will be rubbed off, or rather the shoot which it will produce, as soon as the upper one shall be secured to a stake, and free from danger of being blown off by the wind. The same also may be said of all but four of the buds on the cane that is to form the arm. Plate 46 shows the appearance which it will present, with the cane laid down for the first season's arm, the buds being entire. The four small lines standing above the buds represent the canes which will be produced from them at the end of the season.

To prune for the next season, (see Plate No. 46,) cut all of these canes, except the ones at the extreme left and right, so as to leave but one well-developed bud. The one at the right is to bear two buds, (a spur with two buds,) and the one at the left is to be laid down to complete the arm of the desired length, which may be about three feet or a little more, according to the distance of the vines in the rows, and this will be in a measure governed by the size and habit of the vines which are planted, or they may be short-jointed or otherwise. From the short end or spur with two buds, two shoots will this year be taken. All of these shoots are supposed to have borne two or three bunches each, according to the judgment of the vineyardist—two bunches perhaps being the safer number, although no apprehension need be had from the greatest number that can be taken, according to this plan, from strong, well-managed vines; and this may be regarded as one of the excellencies of the system, that while a good crop may be always confidently expected, a ruinous one can scarcely be taken. It has other great advantages, which we will not now consider.

We will suppose the vines are trained in a single row before a fence or wall not more than four feet in hight, where it is desirable to make the most of shelter or early ripening of the fruit. See Plate No. 55.

Both canes of Plate No. 46 will be cut at *c c*, and at the end of the season will produce the appearance shown in Plate No. 47. These arms are supposed to be a little less than two feet in length, and if the vines are planted four feet apart, which for Delaware is a good distance, the system may be considered fully established, but the vines will not be in full bearing until all or a part of the spurs are furnished with two shoots each.

To grow two canes or double canes, at pruning make two-bud spurs, and of course for one shoot cut to one bud. If the vines are planted more than four feet apart, a longer time will be required to establish the system and bring them into full bearing; for not more than two feet of arm can be produced in one season and remain permanently productive. The arms are lengthened by laying down the end canes, *c c*, in a horizontal position, and cutting to the desired length always, not to exceed two feet at each end, in one season.

If this plan of two arms is adopted, no long canes need be taken, but while the vines are young and very vigorous, more than three or four leaves must be made above the upper bunch before "stopping," or the next season's fruit will appear in autumn of the current year. It must be borne in mind also that the fruit will not set well on young vines if the stopping is too early or too severe; for too much energy of growth tends so strongly to wood that the blossoms become abortive.

Plate No. 48.

Plate No. 48 represents the plan which has just been described, before any shoots have pushed forth. By cutting at *a*, the system of spur and arm, or, if it is desired, the spur and bow, may be formed by bending the cane or arm. We shall hereafter describe this more fully with appropriate cuts, but not to recommend it as nearly equal to that which we have just described, for the vineyard for wine, and for the vineyard only is it admissible.

We may here remark that many systems which vary but little in principle, although

considerably in form, have been adopted by different countries or sections of the same country, generally in consequence of peculiar circumstances, the consideration of which would at present only tend to embarrassment, which we strive to avoid.

Plate No. 49.

In Plate No. 49 we have the arms completed, and the vine pruned ready to produce two shoots to each spur. While the vines are young, it is well when only one shoot is desired to prune as if for two, for the bud next to the cut is not unfrequently damaged by the drying of the wood too near it, and sometimes destroyed. In older vines the wood becomes so compact that this does not take place.

These are supposed to be about three feet each in length. For the Thomery plan they are generally about four feet in length, and one year more of time will be required to produce them. They may, it is true, be produced at once from a vine that has made canes of eight feet or upwards each, by cutting each cane at four feet or a little less, but in that case the bearing canes near the center will soon become unhealthy and fail. The tendency of growth is from the center toward the ends of the arms, and the consequent damage can only be avoided when making long arms by successive stages, as recommended.

We have more particularly described the formation of long arms and the importance of the successive stages, because they perform an important office in several systems of garden training, and especially in training upon houses in cities and villages, which in this country has received but little attention, because few know with what facility the southern and eastern sides of their houses and buildings may be covered with the most beautiful of all vines while its foliage lasts, and that under such circumstances not only is the fruit unfailingly produced in surprising quantity, but its time of maturity is also so greatly hastened that few will be willing to make their residence in a climate so severe as not to permit the perfect ripening of early kinds of grapes on the south side of their houses. The improvement in quality, too, is worthy of consideration as well as their safety from depredation, which is sometimes a discouragement that prevents planting.

Plate No. 20 is a very good representation of the living vine fully established in bearing, and may rank as one of the best for vineyard or open garden. Two prime requisites are simplicity and efficiency, by which both ground and open sky may be fully occupied, and all the parts easily kept in just balance of proportion. It is equally applicable to permanence and renewal, but for the latter it is unequaled both for the crops that may be afforded in consequence of the little loss incurred by growing the preparatory cane for replacement, and for the facility with which any loss of parts may be supplied without deprivation of crop. The ordinary plans of renewal not only require more knowledge of the management of the vine than ordinary cultivators can very readily acquire; but under the best of management require that a large portion of its bearing ability of the current season shall be given up in preparation for the coming season, at the same time causing derangement in the balance of the different parts. The permanent method is represented in the plan before us as may be understood from bearing the canes, some of which are double, and all spring from spurs, while from the renewal plan all must spring directly from the arm by the shooting of its buds which is renewed every season.

The combinations of stake and wire trellis for the vineyard, in simplicity, economy, and efficiency, leave little for improvement to expect. A system of shelter for unfavorable climates, (and in fact for all climates,) has been recommended, (for account of which see Plate No. 34.) To avoid confusion, only the upper and lower portion of the stakes are shown, and a small portion of the upper wire. Another wire should be drawn along, about eight inches above the arms, to save the young shoots from being blown off by fierce spring winds. At the right may be seen a vine in full bear-

ing, carrying a moderate crop, but such as a well-treated vine will always finish out in perfection of quality without overtasking its own powers for the protection of its wood and general health. If a constant system is pursued, a stout stake or small post will be required, as shown in the plate. If a renewal or half renewal plan is adopted, the arm may be fastened to the stake of the adjoining vine, as shown by the middle one.

On this the different operations performed in different years may be brought to mind by the scars, as seen at *a*, when it was but a single shoot at *b b*, when it was of two canes, and then the first formation of the spurs on the arm, and also of the spur from which the three canes sprung, which are supported by the stake. The cut, to make the spur of three eyes is indicated, by which the long canes are provided for the coming season. The same may also be seen on the vine at the left and at *c*, the manner of pruning the double canes, the upper one always being taken away by cutting through the spurs or old wood—two buds being left on the lower cane which forms its spur from which next season's canes are to spring. To make two canes spring from those that last season were single, cut, leaving two buds, from each of which a shoot will push. The fruit is supposed to have been removed from the vines which are carrying none, all being of the same age.

Should any of our readers visit the vineyard of J. E. Mottier, Cincinnati, Ohio, next season, they may see fruit and vines as regularly disposed as in the engraving.

The stopping of the canes is clearly shown at the tops of both the long and the short ones, but the scale is too small to represent the stopping of the laterals, none of which are represented.

Plate No. 51 represents a vine in full crop with all of the leaves removed except from one cane, according to the renewal method. It may be remarked in passing, that possibly for a time heavier crops may be grown in this way by renewal, but the best and highest flavored fruit, and consequently the best wine will be produced by the permanent plan. Which is the best has not yet been demonstrated.

Plates No. 52, 53, 54 represent the single bow plan as practiced in Ohio, and also pretty extensively in Germany and some other parts of Europe. The preparatory step in this, as in all other plans, is first to obtain one strong cane like that shown by Plate No. 44. One of the objects very desirable in the management of the vineyard beyond those of the regulation of the crop and systematic adjustment of the length of canes and quantity of foliage to the amount of fruit, is cheapness of support or trellis. This is one of the great recommendations of the bow method, only one stake being employed for each stock. It is very far from being a perfect plan, but large crops are produced by it, and the vines are without difficulty maintained in their established condition. Each cane as it springs from the bow is disposed in a different direction, but by the weight of the fruit all before the end of the season are inclined to a pendent direction. The size of the bunches and berries does not vary greatly in those which spring from different parts of the bow, but the fruit borne on the canes least turned from the horizontal direction and nearest the stock is best.

The bow plan is from necessity one of renewal, for both the bow and the bearing canes are too unfavorably circumstanced for maintaining their health and vigor, to be continued for the production of fruit the next season. At pruning, the bow is cut away, and the upper one of the three tall canes; one of the remaining canes is cut of sufficient length to make the bow, and the lowest is pruned to a spur of three eyes to reproduce the three long canes. A serious objection to this plan besides the inequality of the fruit, is the want of support to the bearing canes by which both leaves and fruit are damaged and sometimes lost by swinging loose in the wind. The plates scarcely need any explanation. No. 50 represents the two strong canes, ready for pruning, with the places for cutting, marked. No. 51 represents the same pruned, with the spur and long cane, the latter also bent into the bow; the three lines from Z, pointing to the three buds of the spur from which the long canes are to spring, as seen in Plate No. 53, which represents the vine in full bearing. Plate No. 54 represents the same plan doubled, with a partial support to the bearing canes. At F F, the mark for cutting away the bows after fruiting, the pruning being the same as for the single plan. Plate No. 54 is essentially the same

as Plate No. 20, only managed by renewal of the arm, and consequently it can have no spurs or double canes on the arm. This is a modification of the bow plan, straightening the bow to an arm, and providing a trellis for the support of the bearing canes. These are renewal plans, but there is one known distinctively as "*the* renewal plan," or the renewal of Speechley and Clement Hoare. This plan, although not original with Speechley, received a strong impulse to currency by him, being sketched in his quarto volume on the cultivation of vines under glass. It was amplified later by C. Hoare, who wrote chiefly to instruct in the management of vines in open ground, trained on walls. It has been much talked of in this country, and but little understood. Plate No. 48 represents the plan advanced to the time of taking the first system of long canes; the four buds on each arm being ready for that purpose. These should be grown to whatever hight they may attain by the end of September, when they are stopped as we have seen at *e*, and again at *f*, Plates 44, 45. To moderate the tendency of the action, so that the lower buds may become well developed, the canes are made to take a serpentine direction, as shown in Plate No. 55. Two canes on each arm are used for bearing and two for renewal. The four for renewal are represented at B, B, B, B, now pruned, ready for bearing the next season, like the one shown in fruit at A. At A, on the extreme left is seen a spur, and two like it on the other arm; these have also borne fruit like A, and the branches have been cut away as that at A is ready to be cut, to complete the pruning for the next season. At B B, may be seen marks where these branches will be cut at next season's pruning, after having borne their crop as now seen at A. The dotted line S, shows a modification of the same renewal plan designed to obviate the loss of space, the dotted line having borne such a crop as is seen at A. This plan, in all of its modifications, is complicated and difficult of execution for a

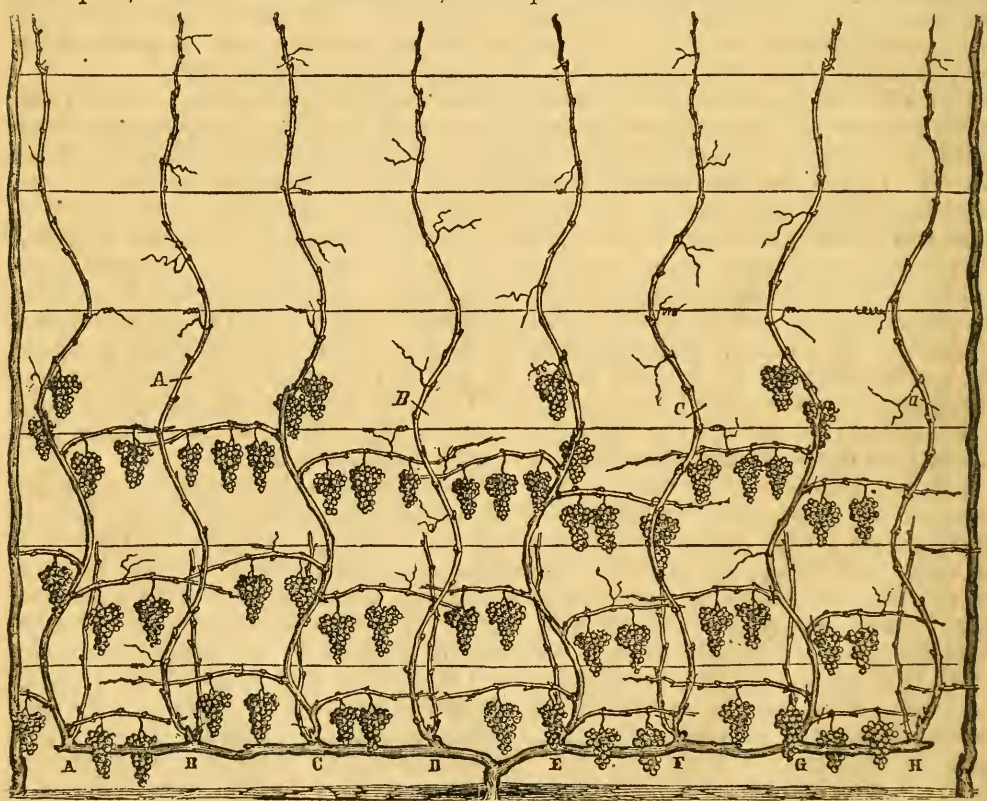


Plate No. 58.

beginner, or one who does not expect to give it constant attention, requiring the skill of a practician who has a good knowledge of the habits and requirements of the

vine, to continue it successfully in operation after having established it in full bearing. Plate No. 58 represents the plan brought to within one year of full establishment; and Plate No. 41, of Descriptive Catalogue, represents a section of a vine in full bearing, at its eighth year.

For the base of this plan we come back to one most simple, that is equally adapted for garden or vineyard, and generally known as the Medoc vineyard plan, for which Plate 57 was designed as an illustration. This will only cover a wall four feet high at most, and can never get beyond its single system of upright bearing canes, each bearing its three bunches. It is often desirable to cover high walls and buildings, and to have the vines perpetually productive. It was an effort of much practical knowledge that produced the plan for doing it represented in Plates 55 and 58; but the utmost limit to which this could singly be made to reach may be stated at ten feet, and not more than half of that without difficulty in maintenance. We often wish to cover an elevation more than twice as great or even three times. The most obvious means apparently would be by the plan represented in Plate 56, or that in Plate No. 59; both of which would soon result in such a failure as is represented in Plate No. 45 of Descriptive Catalogue, To do it speedily, and with some degree of permanence, the plan represented in Plate No. 60 might be adopted, which is that of No. 43, D. C., doubled; one being placed above the other. By this means a hight of twelve feet is pretty easily reached, and for a time uniformly covered with fruit; but the upward tendency of the action would soon begin to leave the lower bearing portion of each set of stocks without fruit or living branches. One of the advantages of the plan shown in Plate No. 60 is, that when the lower bearing portions fail, they can very easily and speedily be restored by cutting down about two thirds of the bearing portion of each stock. New bearing canes will immediately spring out from the portion below, and the next season the restoration of the portion above may be begun, and completed the second or third season from the cutting. The fruit on the few canes represents all of them, as all are supposed to be carrying about the same amount.

The student will be surprised, in examining most of the good systems, to find how nearly the same amount of fruit is borne by them all, when in full bearing. The merit of one above another consists in facility of execution or permanence of *full* production, and in the *quality* of the fruit. The object of renewal is to compensate for over-cropping, and although by this means the largest crops may be produced, the best fruit can not.

TRAINING ON BUILDINGS.

Plate No. 45, Descriptive Catalogue, represents the most common method, but the distribution soon becomes very uneven and unsightly, and the vines bear but little, and that at the highest points. Plate 46, D. C., shows how the same house may be covered with foliage and fruit in their season perpetually. When a building so high is to be covered, a wide border and two rows of vines will be required. The first row to be planted as if for the ordinary Thomery method, and the second in the same manner, eight or ten feet from it. If the house is thirty feet high, the width of the border should not be less than twenty. The latter row is to be trained to stakes at least two seasons, and when led to the house the horizontal portions are to be kept from taking root in the part given to the first row, by laying them on strips of boards, bricks, or stones. Afterward they may be covered.

It will not be difficult to take each vine where it is marked by a letter or figure, and trace it to its distribution for bearing.

If we take the letter a at the left of the central house, (omitting a, b, c, b, of the house at the left,) we shall find it dividing under the window of the second story, and a branch rising on each side of the window midway, where each takes a horizontal direction along a slat; the bearing canes only springing from the horizontal portions. If we take the next letter, b, we see it divides for the lower course. That marked by c rises for the upper course; the little upright bearing canes of which are represented. Fig. 5 of the first row, designates the vine that gives the next to the upper courses.

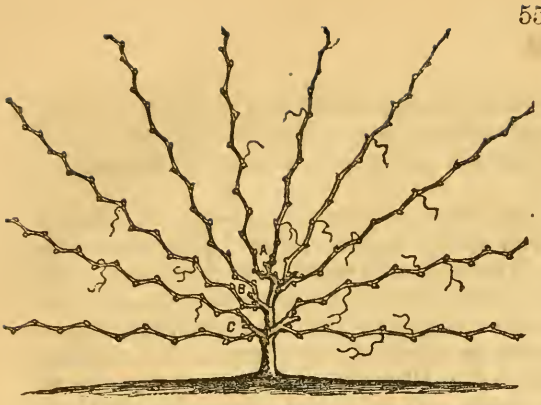


Plate No. 56.

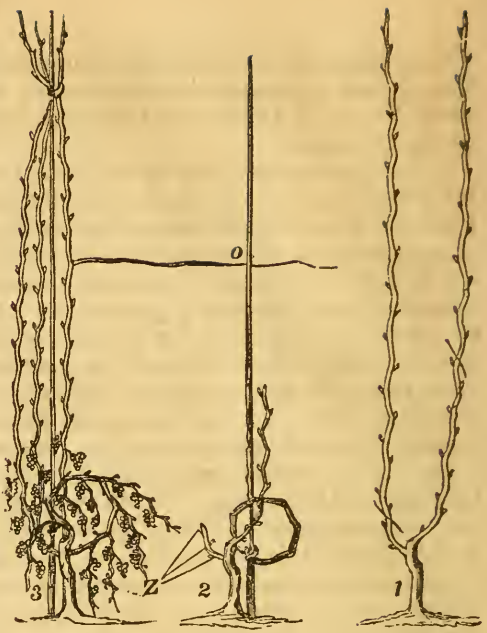


Plate No. 52. Plate No. 51. Plate No. 50.

Plate No. 54.

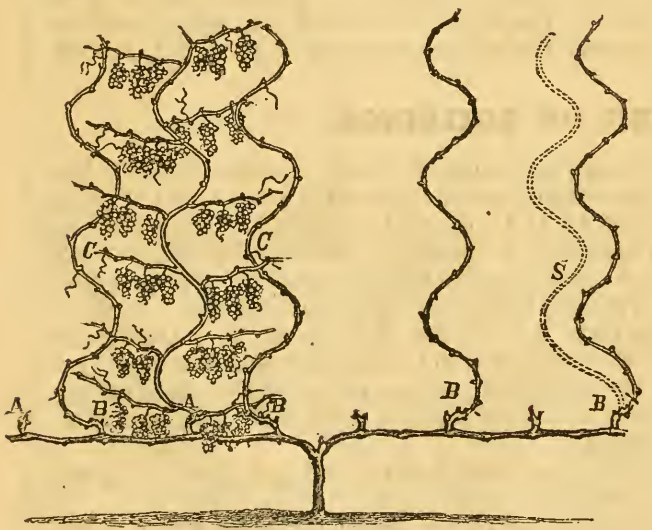


Plate No. 55.

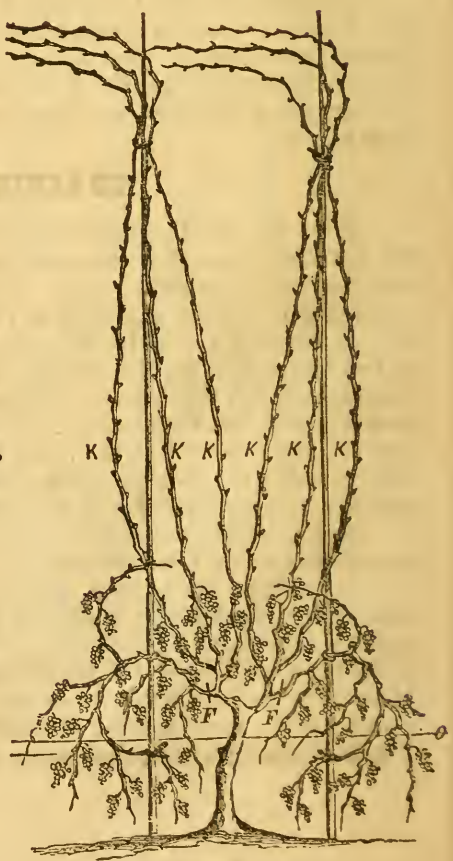


Plate No. 58.

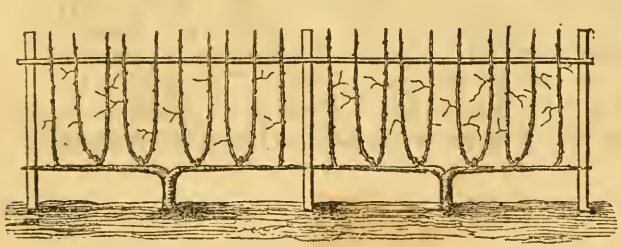


Plate No. 57.

The tendency of the vine to cease bearing below when permitted to bear above, except under certain conditions, in consequence of the upward tendency of the action, has been already so fully treated, that Plate No. 59 requires little explanation. The canes on the standards D and E, if pruned as marked at f f, will soon take all of the action and life from h h, as has already been done from the parts below. B is already nearly dead, but may be reproduced by C, if cut quite away, and C be pruned at about two feet.

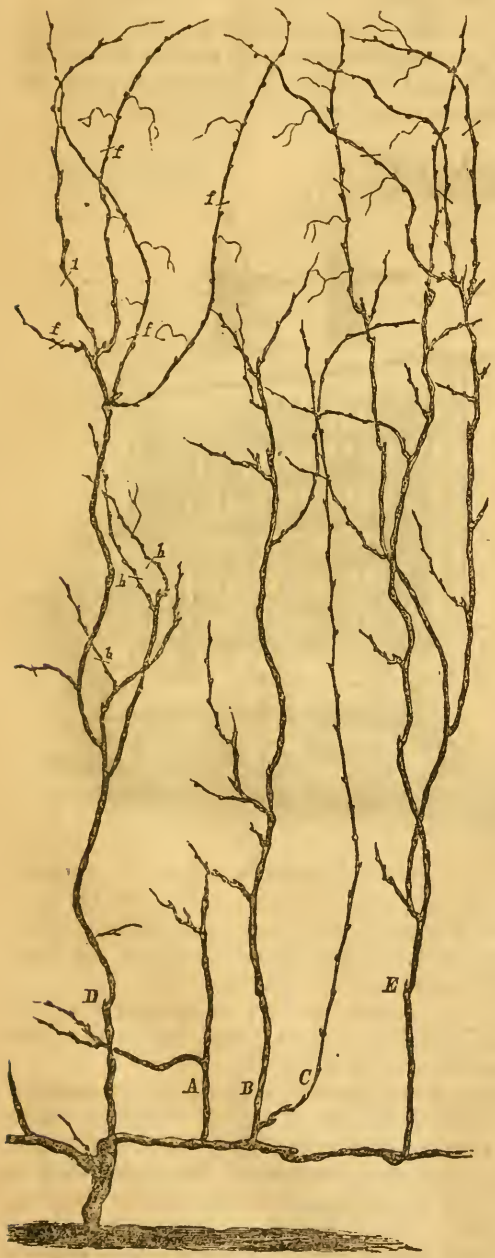


Plate No. 59.

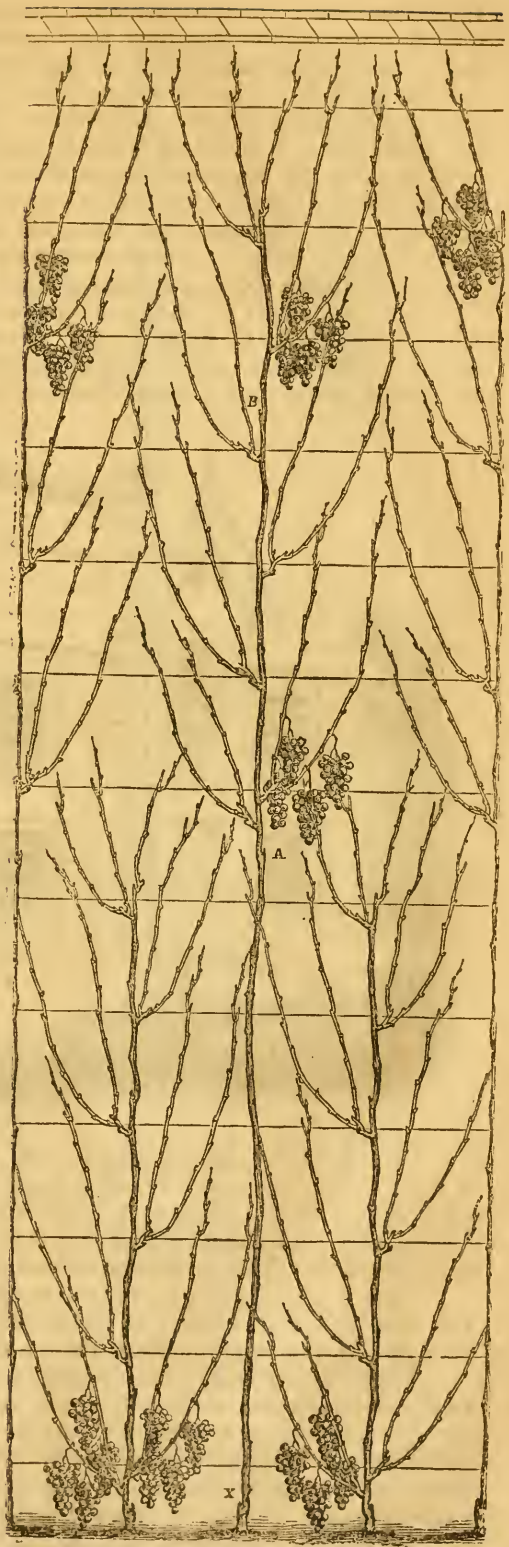


Plate No. 60.

It divides under the upper window, and has its bearing canes (coursons) also represented. All of the vines have their bearing canes (coursons) on their horizontal portions; to avoid confusion, they are not shown in the engravings, except as mentioned.

Plate 49, D. C., has its vines planted in three rows, the first at the foot of the principal building, the second at the foot of the arbor, and the third as represented by the dotted lines. These may be more readily followed to their distribution. One vine only of these has the courses represented, and the wires also, both being understood throughout. Those on the end of the house are carried above the veranda, to avoid darkening the windows, and those on the roof of the veranda have their courses trained perpendicularly; the iron supports of the trellises being seen at each end.

Plate No. 51, D. C., needs no particular description.

Plate No. 52, D. C., shows the method of planting for covering the side and roof of the stable shown by Plate No. 63. In this, the comfort gained by the shade is worth the cost. The eaves project more than two feet, and the trellis is made outside of the eaves, and on the roof it is raised at least eighteen inches above the shingles.

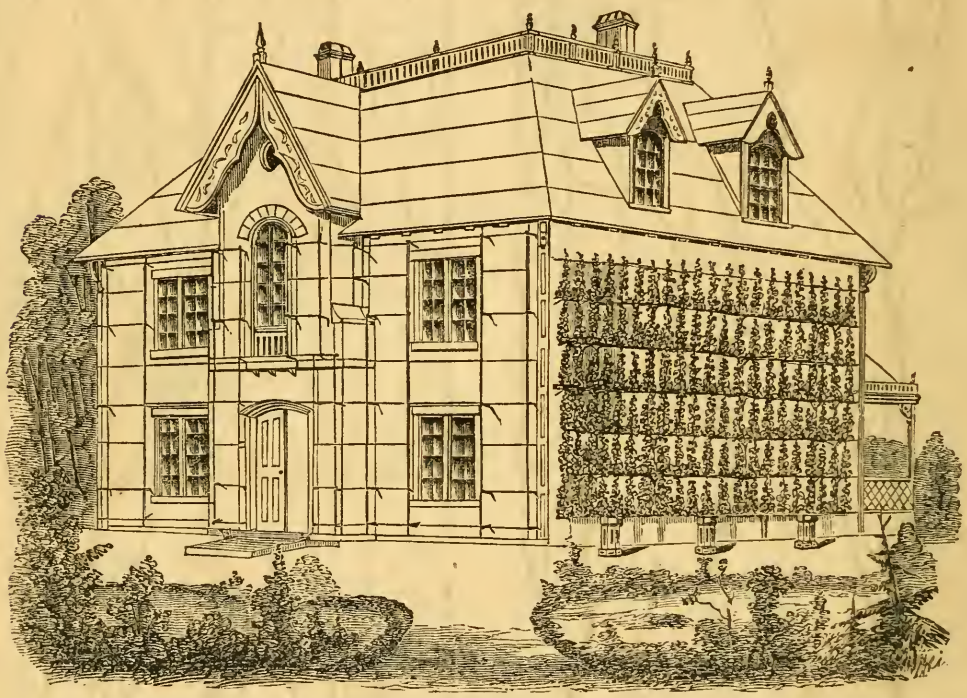


Plate No. 61.

Plate No. 61 represents a house with vines on its south-easterly side, as they appear in June. The stocks are brought together and concealed by the ornamental arrangement shown in the engraving. The trellis is placed two feet from the house, and a little gallery runs along back of the vines at about two feet above the top of the first-story windows. The wires used to sustain the courses are not represented.

On the south-west, which is the garden front, an iron trellis is shown, for covering this side also with vines. It is equally adapted for a street front, but in that case fruit should not be taken below the top of the first-story windows.

Plate 62 represents a house with its garden-front covered with vines on a wooden trellis, but wires are used in addition, as in Plate No. 49, D. C. Four of the vines were grown as represented at A, A, A, A, two seasons before being led to the house. After the vines become established in bearing, the whole surface of the border may be made a parterre by flowers in pots, placed as shown by a few specimens. Bearing canes like those at ⋈ are supposed throughout.

Plate No. 63 represents a stable with south side and roof covered. The manner of planting the vines is more clearly seen in Plate No. 52, D. C.

Plate No. 62.

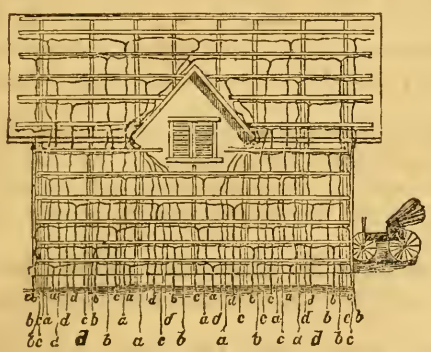


Plate No. 63.

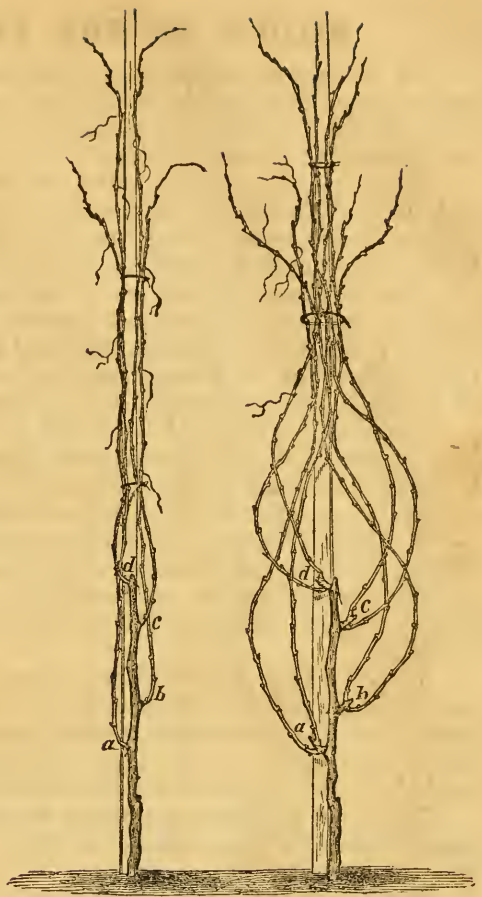


Plate No. 64. Plate No. 65.

As the Medoc Vineyard method of training has been exhibited, a short description of what is called the Jura plan may also be given. The former has the vines supported by a trellis; the latter by stakes, as shown by Plates No. 64 and 65. By this plan, from four thousand to six thousand vines are planted on an acre, and it is preferred for some very poor light soils.

Plate No. 56 represents the Fan mode in its early stage. This plan is very difficult of management, and inefficient at the best; and requires a long explanation to be intelligible, notwithstanding it is more frequently aimed at than any other.

Winter Pruning.

This has been so fully discussed in the chapters on planting and training that no separate chapter is required. The operation may be performed in November or February.

Summer Pruning.

This consists in shortening the bearing canes to the proper length by stopping, which should be commenced in June, before the setting of the fruit, and continued to the end of the season, as shown in Plates 35, 20, etc. The stopping of laterals, and of the long canes toward the end of the season are parts of this operation, all of which have been so clearly shown in our course that no special remarks are needed. All good systems suppose the removal of the laterals, and the stopping of the bearing canes at the proper distance from the branches, and vines can not be successfully managed if these are neglected.

MILDEW OF THE VINE. (OÏDIUM TUCKERI.)

In all ages there have been prevalent parasitic cryptogams, or fungi under this general name, that have drawn their sustenance from the foliage or herbaceous portions of plants and trees, and also from their branches, when in their tender, growing state, and covered with an epidermis.

The parts of these plants that perform the seminal functions are extremely light, and, under circumstances favorable to their dissemination, are carried in the air, and lodge upon vegetation during growth, and under certain conditions generate and grow, to the detriment, and sometimes destruction of the plants which afford their *habitat.*

The circumstances and conditions most favorable to the growth of these parasites, are not such as are most favorable to healthy vegetation, and they take root chiefly, if not entirely, in structures that have been enfeebled by some cause first, and then subjected to the circumstances that are at the same time favorable to the growth of the fungi, and unfavorable to the prosperity of the plants. A course of extremely active vegetation, followed by a cold period, and especially when attended by dark fogs, is always to be regarded with apprehension for the safety of certain plants. Vines are sometimes slightly attacked in early summer, but generally suffer the most serious damage after the fruit is more than half grown.

From time immemorial European vines have suffered from the *Erineum*, though not to such an extent that much destruction or loss was feared from it; but in the year 1845 a new *Oïdium* appeared in a vinery near Margate, England, of which a gardener by the name of Tucker had charge, and by whom it was first brought to notice.

It spread rapidly through the houses of Europe, and from them to the vineyards. until most of the vine districts were overspread with the desolation. It was universally accepted as a public calamity, and the need of a remedy was felt to be of the utmost importance. Very large prizes were offered for the discovery of one that would be easy of application and efficacious.

The most important premiums were awarded to Mr. Mares, who showed, by an extended series of experiments, the efficacy of sulphur, and invented convenient apparatus for its application.

For obtaining the full benefits of its action, it was found that three applications were required during the season, at periods differing according to locality and earliness, but ranging from the tenth to the last of May for the first, the same in June for the second, and the same in July for the third.

The application in July is generally found to be unnecessary if the others have been thoroughly made at the proper time, and under the right conditions.

It is not called for in spring, until some well-developed leaves have been formed; but the first appearance of the mildew should be carefully looked for, and the remedy applied at the slightest indication of its coming, and better if before any manifestation of it takes place, if the leaves are sufficiently developed.

The subject has deeply interested many of the most careful and scientific observers for nearly twenty years, and is too extensive for discussion here, but the practical results, so far as utility is concerned, can be stated in a brief space.

This mildew (Oïdium Tuckeri) is confined in its attacks to the vine chiefly, if not solely, and it only germinates on the vine when predisposed to it by some enfeebling cause, which acts superficially upon the leaves, affecting chiefly the epidermis, softening and impairing its structure.

The predisposing causes are every thing in the management of the vine, by which it falls short of its most perfectly healthful and enduring development.

This statement is very comprehensive, and for its full detail, courses over the whole subject of viticulture, but a few of the principal points may be mentioned to make the case more intelligible. General want of drainage, soil so unfertile as to afford scanty nourishment, or so highly enriched as to give distended but not enduring

growth, so shallow as to suffer from drouth, or so impermeable a little distance from the surface, that the rootlets will remain immersed in wetness in consequence of the falling water not passing off freely, are among the most common *terrestrial predisposing* causes that operate after the vines have become well established in bearing as well as during their preparatory growth. That of covering the vines too deeply in planting must not be unnoticed, for it is one of the most frequent occurrence, and disastrous in its effects. Covering too lightly may be equally injurious.

Among the most common *aërial* predisposing causes, are the crowded state of the leaves, by which one overshadows another, and prevents full exposure to the action of the sun. This comes from suffering the canes to grow too near together, or too long, or from permitting the laterals to become too long before being removed.

The same is produced by training the vines too closely to a sheltering wall or building—by proximity of trees or hedges, and by placing the lines of trellis too near each other. A confined place deprived of moving atmosphere, and a bleak place greatly exposed without shelter on any side, are about equally objectionable. A radical defect at the beginning has always existed to a very great extent from using defective plants, that bring the inevitable predisposition with them. This was a leading cause of failure less prompt than at present before the oïdium of Tucker appeared.

The exciting causes, besides general low temperature and excessive rain, are changes of the atmosphere from favorable to unfavorable conditions, often sudden, severe, and long-continued, by which, as before stated, the texture of the epidermis is softened and covered with the adhesive exudation that favors the lodgment and germination of the spores; but the weather also favors the deposit of moisture, and brings the scarcity of light that favors the parasitic germination. It is believed that the sporules of some of the parasitic fungi are taken up by the stomata of the roots with the plant food; and from that it has been *argued* that the same occurs, also, with the Oïdium Tuckeri in the grape; but careful and extensive microscopic examinations have shown that this does not take place.

It should be stated that in Europe, while the oïdium was involving all of the vines in great damage or destruction, the American vines, Isabella and Catawba, by their side, were not affected, showing their greater ability to resist the predisposing or exciting causes, or perhaps both. The European vineyards for many years were rendered so unproductive, that wine advanced several fold in price, and a little progress was made in introducing American grapes for its production. The Isabella was chosen for that purpose, but from the "*badness* of the quality," in consequence particularly of its offensive odor and flavor, it was not planted to much extent. The use of sulphur and improved management have happily restored the European vineyards to health and productiveness.

THE THEORY OF THE SULPHUR REMEDY.

The oïdium, at the commencement of germination, is not only extremely minute, but very sensitive to caustic influences, and easily destroyed, while the leaf of the vine is not easily offended. The sulphur, when minutely divided, so as to form an impalpable powder, as is the case when it is finely sublimed, and when it is thoroughly dry, is easily brought into slow combustion by the action of the sun, and thus produces a very small quantity of sulphuric acid in the form of vapor. It is the product of this combustion that gives the peculiar odor of the *fumes* of sulphur, and to this is owing its action upon the oïdium or mildew. Until this combustion takes place, and the sulphuric acid is formed, the sulphur remains as inactive as if it were only quartz sand.

While the sulphur remains moist it has no action, and but very little, comparatively, when in coarse division; nor does it act efficiently in cool, moist weather. The sulphur, if applied in a state of dryness, on a dry day, with an active sulphurator, finds lodgment for its fine microscopic particles on every part of the vine; but it will remain longest in the velvety reticulations of the under side of the leaves, where it is most

wanted, not only because that is the place most favorable to the performance and constancy of its action, but also because the oïdium chiefly attacks the under side.

It is a number of years since I have used it on our hardy vines, not finding any occasion for it under proper management. Although useful, and perhaps indispensable under some circumstances, it must not be expected to go very far in compensation for wrong treatment or neglect. The cost of the material, and labor of applying it, will amount to but a small per centage on the value of a good crop; and it is not unlikely that it will come into general use on a twofold consideration, for it will probably be found to be as effective against the thrips, which are an enemy much more to be feared, in connection with our best new kinds, than the mildew, and can not, like the latter, be done away with by the development of the strength of the vine and attention to its wants in cultivation.

APPARATUS FOR APPLYING SULPHUR.

A great number of appliances have been invented for the application of sulphur; two of the best are represented in the engravings. Plate No. 67 represents one by M. de la Vergne, and plates Nos. 68 and 69 are by M. Gontier. The latter is, perhaps, to be preferred for general use, although the advantages of the former are important for the vineyard.

That of M. de la Vergne is the most simple. The curved tube is more than one inch in diameter, and is covered at its outer end with fine wire gauze. The implement has no valve, the air being admitted through the tube, and at going out, passes through it by forcible expulsion, charged with the fine sulphur dust, by passing over the quantity of it with which the instrument is to be kept supplied.

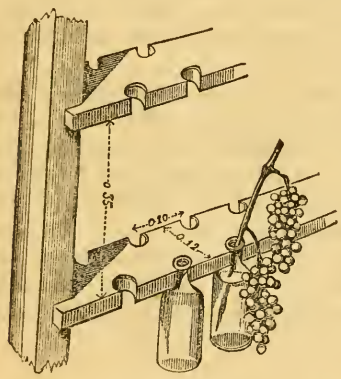


Plate No. 83.

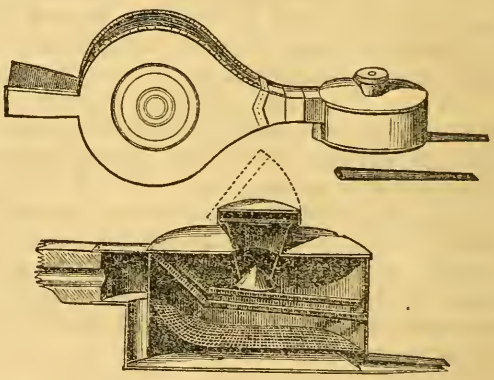


Plate Nos. 68 and 69.

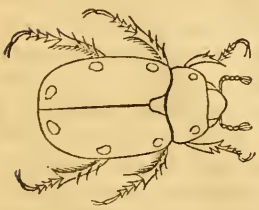


Plate No. 75.

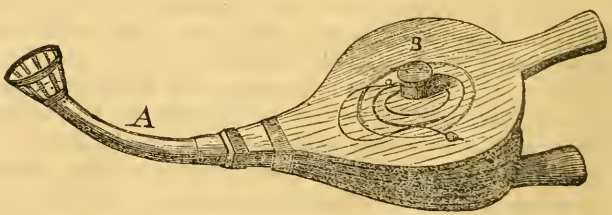


Plate No. 67.

That of M. Gontier is more complicated in its structure. The sulphur is not placed within the bellows, but in a little case with an upper and lower chamber. Into the upper chamber the sulphur is put through an opening in the top that must be firmly closed after the sulphur is put in. Some little bars are seen in the upper

chamber that are to break the sulphur, or keep it from forming a coherent mass, before falling upon the floor, which is pierced with fine holes. The sulphur sifts through these holes in the floor of the upper chamber into the one below, when it is acted upon by the wind from the bellows, and driven in fine dust through the tube, forming an almost invisible cloud that rests upon all parts of the vine, and lodging most permanently in the fine gauze-like web of the under side of the leaves, which also form the principal lodgment for the sporules of the mildew. The vapor of sulphuric acid is so slowly formed that it exercises no appreciably injurious influence upon the vine, but is sufficiently active to destroy the fungi and drive away the thrips. The section of the *magazine* (Plate No. 69) gives a clear idea of the interior arrangement, which will enable mechanics to construct them without much difficulty. The valve of the bellows must be different from the ordinary construction, to enable it to act when held in any position. A few of these apparatuses have been imported by Mr. P. B. Mead, for patterns from which others can be very cheaply made by any skillful tinman. They can be obtained from him at the cost of importation. A more particular description of these and some others, will be given in LANDMARKS.

INSECTS INJURIOUS TO THE VINE.

Of these, there are very few that have caused much damage, and the vine may claim a degree of exemption from destructive enemies beyond any other fruit.

The first that makes its appearance in the spring is the *pyrale of the vine,* and without attention it will sometimes become very destructive. It winds the young shoots with silk just as they begin to put forth, and eats the leaves, and often the rudimentary bunch before inflorescence. The only effectual remedy is to unroll each shoot by hand, and take out the little worm. The moth and its larva at leaving the egg, and of full size, are represented in the engraving. (Plates Nos. 70 and 71)

The rose-bug in some districts has been very troublesome. The Delaware vine has shown a remarkable exemption from attack in numerous instances, when all the other kinds have been greatly injured. Vines in gardens are sometimes attacked by these little beetles in such numbers that the crops would be entirely destroyed if neglected; but large vineyards, where the vines are well trained, and kept free from weeds, are rarely attacked so as to cause much damage. (Plate No. 72.)

The only remedy, after they appear, is to pick them off by hand, or knock them into a convenient vessel of water, which is speedily done.

This, although somewhat troublesome, has been found much less so than would be supposed before trial.

Both the tent and spinner caterpillar sometimes feed upon the young vines. The former are easily suppressed by destroying the nests before the commencement of their migratory course. The latter, comprising the large green naked caterpillars, are never sufficiently numerous to be much feared, except in case of single young vines. They are very gluttonous, and from their green color, not easily discovered, unless carefully looked for, until their ravages have destroyed a large portion of a shoot. The name Philampelus (Vine-lover) comes from its habit of feeding on the leaves of the Ampelides generally, including the grape especially. The representation of it (Plate No. 73) is taken from the excellent work of the late Mr. Harris.

The brown aphis is another enemy also of little importance. It is an exceedingly minute insect that sucks the juice of plants, and occasionally collects in such numbers on a young shoot as to conceal a portion from sight. If the case occurs on a vine with only one shoot, and that of special importance, the aphids may all be washed off in one moment with a rag or sponge and soap-suds. Vineyardists remove them with their hands at sight, and do not consider them of sufficient importance to be named. Their destruction is ordinarily effected by pinching off a few inches of the tender shoot and stamping it under foot, doing no injury to the vine. (Plate No. 74.)

There are other beetles that sometimes infest vineyards and gardens, but they so rarely do any important injury that they are very little known. The drab-colored Quaker-bug (*Palidnota Punctata*) is formidable in appearance from its large size, but is never so numerous that it can not be suppressed at trifling cost by picking them from the leaves while performing the other operations. A row of dark spots (puncta) on each side give its distinctive name. (Plate No. 75.)

The steel-blue flea-beetle (*Haltica Chalybea* or *Oleracea*) is one of a class, differing in color, sometimes met with, causing damage by burrowing in the buds and girdling the extremities of tender shoots. No more satisfactory remedy has yet been proposed than that for the rose-bugs, but it is not often that these call for any attention. Plate No. 76 is a magnified representation of the Haltica Chalybea.

A very minute insect called Red Spider (*Acarus Tellarius*) is one of the most troublesome insect-enemies of plants under glass, and especially of the grape and peach. If taken at the beginning, thorough drenching with water so that the leaves, on both their upper and lower surfaces, may be kept *wet* for a considerable time, will destroy them; but after they have gained an established lodgment, it is difficult to get rid of them, even by washing both sides of every leaf with a sponge and soapy water repeatedly. In very dry weather these insects spread from the houses to the trees in the garden or nursery, and especially to the pears, and at length to the vines, if they are close to the infested trees and have become enfeebled in their action. The vines with leaves in full, vigorous, healthy action, remain free from their attacks. Syringing thoroughly, as soon as attacked, with whale-oil soap-suds is a certain remedy; half a pound to six to ten gallons of water is sufficient, the object of the soap being chiefly to make the water adhere to the leaves for sufficient time to accomplish its object.

The mealy bug (*Coccus Adonidum*) is another enemy that is common to houses and gardens, but less frequent in open culture. These are little troublesome in the open air, except when lodged in the branches of unripe fruit, where they present the appearance of small flocks of cotton. A dilution of soap or a solution of potash will dislodge and destroy them, if applied early with a syringe, and without injury; but later, both leave unpleasant marks upon the fruit. It is only in the garden that annoyance is likely to occur from these insects, and a very little attention at the beginning will entirely destroy them. At first, the mother is seen like a small mound of white meal or mold, and remains fixed with her eggs or young under her, when a touch with the end of a stick of the size of a pencil will destroy them all. The *Pyrethrum* is an effectual unobjectionable remedy, and the same may be said of sulphur when properly applied, as it should be, in *invisible* quantity from an efficient *sulphurator*.

The most important of all the insect enemies of the vine is the *Thrips*, or "leaf-hopper," (*Tettigonia Vitis*,) and more to be dreaded in the vineyard than all of the others together. It is a very small insect, light green in color at first and during its feeding (*sucking*) stage, but becoming beautifully marked and variegated when its transformations are passed and its wings are grown; it flies and leaps with great agility, and is not easily caught or driven away. It makes its appearance sometimes before the end of May, and continues to multiply until the end of the season, feeding upon the under side of the leaves, often until their action is greatly impaired or quite lost.

The crop is never destroyed by these insects, but it is not unfrequently greatly injured in quality, and the ability of the vine for the next season lessened.

A remedy by fumigation with tobacco smoke is easily applied, and effective for a few vines in the garden or on the side of a house, making a tent by joining sheets together to confine the smoke, but in the vineyard this is impracticable.

Syringing with a strong decoction of tobacco, and also with a dilution of whale-oil soap, has been tried, also the two mixed, increasing the strength until the leaves were destroyed, without making much impression upon the Thrips.

Five years ago they were very troublesome with me, but disappeared under the use of sulphur, as applied for mildew, and gave no farther trouble until the past season.

I have known them also disappear under the use of a preparation made from coal tar sprinkled upon the under sides of the leaves; but this remedy is scarcely admissible.

The trials with these remedies have not been very numerous, but appear to warrant confident statements concerning their efficiency.

The insect is about one tenth of an inch long, and is represented in Plate No. 77, magnified three linear times.

When the cultivation of the *Pyrethrum Duchartre* becomes extended, we may expect to find a valuable insect-destroyer in that. Meanwhile, clean culture and free open training will go so far to secure exemption from damage by insects and mildew that the best vineyardists entertain but little apprehension from them.

Plate No. 73.

Plate No. 76.

Plate No. 70.

Plate No. 71.

Plate No. 72.

Plate No. 74.

Plate No. 77.

NOTE.—There are other *leaf-folders* (*Tortrices*) besides that mentioned at the beginning of the chapter, that have done much damage in some of the south-western vineyards, but I have too little personal knowledge of them to speak intelligently of the remedy, which does not appear to me difficult or expensive, and that is, their entire destruction.

Plate No. 78 represents a *Fan*, with gearing for increase of rotary velocity, that was invented for a sulphurator, but may also be used for a *fumigator* with a slight change and a little addition for the reception of the burning tobacco.

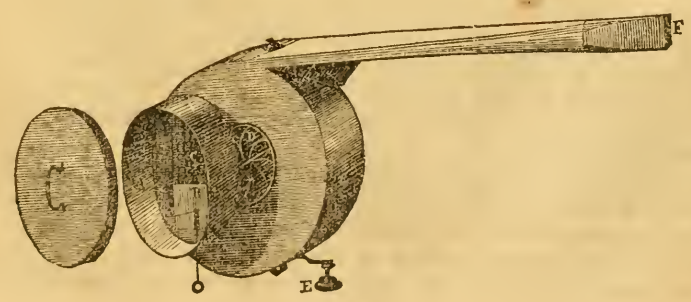


Plate No. 78.

CULTIVATION OF VINEYARDS.

This is very simple, but has some important peculiarities that would not be likely to occur to beginners. It has been already stated that the *feeding-roots* of the vine, like its leaves, are annual, and that at the end of the season their work proper is forever done, and they perish and are renewed, like the leaves.

In a well-prepared vineyard, during the growing and productive season, the soil is filled with these from very near the surface to the depth at which good entertainment for them ceases.

It is important that these should meet with no interruption to their action from the beginning to the end of the season.

These rootlets put forth by nearly equal step with the springing of the leaves, and the co-work assigned to both is simultaneously accomplished at about the time of their fall. The nearness of the rootlets to the surface is measured by the point at which the constant degree of moisture necessary to their health has existed during the season; and under favorable circumstances, this is so near as to not permit the working of the ground *by its movement in masses* beyond the depth of two or three inches, after the early part of June, without injury. But the frequent stirring of the surface to a little depth, is advantageous up to the first of August or later.

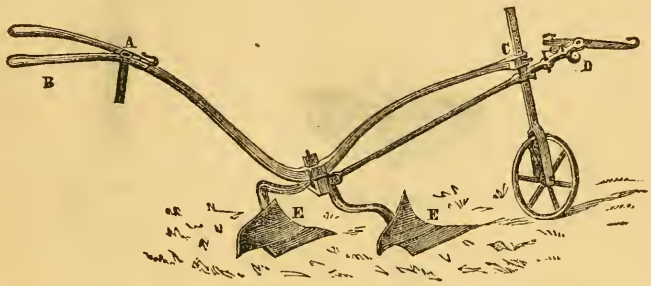


Plate No. 79.

Plate No. 81.

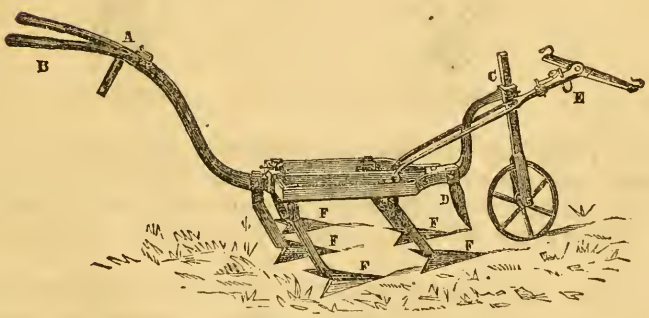


Plate No. 80.

Plate No. 82.

The season of *cultivation* begins in November, *after* the action of rootlets and leaves has ceased. The ground may now be worked with a plow, moving it *en masse*, or reversing and thoroughly disintegrating it to the depth of four or five inches, or even more, varying according to circumstances of open or compact soil, and position of roots in regard to surface.

The first operation is *averse* plowing—turning the furrows *from* the stocks, turning round to the right if an ordinary plow is used; a line of soil will remain along the direction of each row in which the vines stood, which can not be touched by the plow, and which to complete the operation, must be moved by hand with hoes, either of the ordinary kind or the *bidens*

represented Plate No. 81. After the ground has remained in this position a few days, the next operation—*adverse* plowing—is performed, by which the furrows are turned back toward the vines. To finish the ground for winter a cultivator is used, with the two hinder teeth made so as to avoid tearing the vines. The handles are also made with guards to protect the hands from injury by coming in contact with the wire trellis on each side.

Plate No. 79 represents an implement of French invention, that may be used instead of a plow with great advantage, doing the work more expeditiously and much better in regard to tillage. It is fitted with two sets of shares, one for the *averse*, and the other for the *adverse* turning of the furrows. The standard and wheel, C, are indispensable for gauging the depth. At D is shown an arrangement by which the nearness of approach to the vines in working may be accurately and safely adjusted. It is called the *Plow of M. Loyere*, from the name of the inventor.

If a dressing of manure is to be applied, it may be done before any of the operations above named in the fall, but it will best before the last, when it will take most advantageously the action of the water falling upon the surface, whether from snow or rain.

As the growing season advances, the depth of working is lessened, so that the last is but a skimming of the surface. Except for the working in the fall, the draft is very light, and a small animal is greatly to be preferred. A skillful operator, with a gentle and tractable horse well trained, will never damage the vines.

Plate No. 80 shows an implement better calculated for working in the vineyard after the first time in the spring. It is so clearly represented that little explanation is required. From the shape and setting of the shares, it will be seen that, if well-managed, there will be no danger to the roots or stocks. It is called the *Horse-hoe* of M. Loyere.

With either implement, three acres in a day may be carefully done with ease, but necessarily leaving a narrow strip along each row to finish by hand-labor. In this way the tillage of a vineyard will cost but little more than that of a field of Indian corn; and not half so much as a field of corn, including the planting, if the work of the latter is done by hand-hoeing.

When hand-labor only is employed in vineyards, different implements are used, according to the character of the soil. In light, mellow soil a square hoe, with a blade much longer than that of the ordinary farm hoe, is used. In more stony or tenacious formation, a piece is taken out of the middle, as shown in Plate No. 81, leaving it two-toothed or "bidens." If the soil is very tenacious or stony, a triangular, pointed implement is used. (See Plate No. 82.)

Among our farm implements in ordinary use may be found some as well adapted for the cultivation of vines as those specially made for the purpose—the hoe and the many-pronged potato-digger. The latter, made of fine cast steel, with six teeth, each tooth as smooth as the tine of a hay-fork, is preferred by Mr. Mottier to any other implement for his heavy clay soil. The first season after planting, all of the work must be done by hand, and very carefully, and frequent and thorough working is of the greatest importance at this period. Neglect often causes the loss of more than one season's crop. The ground should not merely be kept clear of weeds, but should be frequently stirred if no weeds appear, and especially if the soil is somewhat compact, and during drouth. The representations of foreign implements (Plates Nos. 78 and 80) are introduced to illustrate the principles of peculiar construction for vine-culture. American implements are already in use that need but little change to adapt them to this purpose. To guard against the damage by severe drouth, mulching may sometimes be applied; but it should be spread very thin, and no green material should ever be used. Coarse hay, or straw carefully deprived of its grain, is the best material. Green grass, just mowed from a lawn, and weeds, are very injurious, and often destructive.

PROPAGATION, OR MULTIPLICATION OF STOCKS.

THERE are two ways in which infant vines are produced by the mother vine intended for the multiplication or continuation of the race. The first is that in which immediate, separate, and independent existence is provided for, and the provision carefully laid up in a flinty casket which contains not only the dormant infant, but also a supply of food to sustain it during its early infancy, and until the apparatus for taking up its food from the soil shall be produced, which apparatus is not directly provided by the mother. This little package is called the SEED. The other infant is not prepared for immediate, independent existence, and scarcely appears to be directly designed for separate existence, but rather for increase, in perpetual dependence upon the mother. These infants are not only without roots, as are the other, but also without any *special* store that is calculated to supply food while roots are in course of formation, being particularly fitted to receive their subsistence through the mother. These larger, but more dependent children, are the BUDS. To separate and establish these in an independent existence requires the assistance of art; and there are a diversity of methods for doing it, all of them proper and suited to different circumstances.

Where there is a vigorous mother-plant of fruit-bearing age well established, in good accommodations, this separation is more readily and expeditiously effected by layering than by any other process. The conditions of perfect success are, that the layer shall be properly put into the ground at a sufficient distance from the mother-plant to not find the ground previously occupied by her roots, and that too many plants shall not be taken from the same mother, nor from the same shoot, and that all of the leaves shall be well exposed to the action of the sun during the season.

One season only, suffices to bring the new plant to the best possible condition for transplanting, and also to sufficient maturity of function for immediate fruit-bearing, anticipating the time required for any other ordinary process by at least one or two years, and avoiding liability to all intervening casualties. This, considering the employment of the mother-plant, is the most expensive, but the best method.

See page 33, Plate No. 25, where, instead of cutting off the two branches C, at a, they may be employed to make two or three layers each, and one *fine* layer each, (if bearing is not permitted,) with but little injury to the mother. But in operations so important as this, (of Pla 24) it is not well to risk any thing; for the worth of well-established vines of this kind, it is difficult to estimate. I have referred to it chiefly for illustration, layers being more advantageously taken in number, from vines planted for the purpose.

Good vines may be grown from cuttings, two or three eyes in length, the last season's wood furnishing nourishment to the shoots while roots are forming. The conditions of success are, hard, well-developed, and well-ripened wood, taken not far from its origin, from the parent stock, and set in moderately compact soil, carefully prepared, that shall neither be wet nor dry, until the cutting shall become well-rooted. The danger is, that the tender leaves, while but little or not at all sustained by roots, shall become damaged, thus impairing the health of the plant at the beginning. To make good plants, they must be forwarded early and rapidly, that considerable wood may be made and ripened before fall, for with much green wood at the end of the season, there will be corresponding immature roots; and if little ripe wood, few or no ripe roots that will be able to withstand the winter. Although life may not be destroyed, health is often permanently impaired.

A bed in which cuttings can be grown with a great degree of certainty, may be prepared by setting four boards on edge, and covering with glass set in hot-bed sashes, or better still a hot-bed with its frame and sash, waiting until the severity of the heat has passed, and shading from the sun until the plants have become well rooted. For regulating temperature, a thermometer will be required, and care taken not to have it rise above 90 degrees. The bed should be provided with a shading of cheap cloth,

so that the glass may be partially removed for ventilation and reduction of temperature without exposure to the sun. In this process there is no difficulty but such as arises from the constant watchfulness that is required to regulate temperature and moisture. A person who is determined to become a good cultivator, will succeed in this, and find both his habit of attention and his knowledge greatly improved by the practice of one season. This is a miniature "propagating-house," and requires all of the attention of a large one; and in this many of the best of plants may be grown. If it is desired to strike many cuttings, pots may be filled with very sandy soil of little fertility or retentiveness; the cuttings being set about one inch apart around the edge. These, when rooted, which may be in from four to six weeks, may be carefully taken out and set singly into pots, or set into the ground. If the operation is done with care, and the plants shaded from the sun for a week or two, gradually lessening the shade by continuing it only in the middle of the day, few or no plants need be lost. Protection from tearing winds is needed or desirable, for a great part of the season, to secure the best growth of the young vines, so that both wood and roots may be well matured the first season.

With care and suitable appliances, vines better than from cuttings may be grown from single "eyes," or buds, each one making a strong, well-rooted plant. We have said that each bud, or "eye," as professionally called, is an infant plant without root, not designed in regular process of nature to be detached and form an independent vine; but by art this may be effected, and the process is called "propagation from or by single eyes." To do this, the eye must be encouraged at the proper time to shoot, and be sustained until roots are formed, and the young shoot has made its first growth. Roots can not be formed to much extent without the action of the leaves, and the small piece of wood which is attached to the eye affords but little sustenance to the leaves—so little that a dry, moving atmosphere, particularly if aided by the direct rays of the sun, will soon dry them up, causing death. Leaves will exist for a length of time in an atmosphere so moist that they take nearly as much moisture from it as they yield to it, if their operations are not excited to great activity by too strong light. Thus our indications are, shade and uniform moisture. To these conditions must be added another, that is, heat, to the medium in which the eyes are placed for rooting, (technically, "striking,") a little above that of the atmosphere provided for the leaves. This is called bottom heat, as it is applied below the plants; and to command success it must be nearly uniform. The eyes are not put into fertile soil, but sand; for the roots at first, though large, and apparently able, do not take nourishment from the ground, and for a time the larger the foliage becomes the less substance it has; but as soon as little feeding fibers appear on the sides of the long roots, the plants must be set in food-supplying soil, and very soon thereafter fully exposed to the sun and air, but not to the severities of atmospheric changes, which they are not yet for a long time able to bear uninjured; and it may be well to bear in mind the indisputable truth, that in man, beast, or plant, the early age, passed under circumstances most favorable to perfect development, safely guarded from injury, is the best preparation for a vigorous, productive maturity. Propagating-houses, it must be understood, are not "hot-houses," but simply dwellings to guard the tender beginning from injury or hindrance, that would be damaging or destructive; and vines well managed in them acquire a hardihood and vigor which bring them to an earlier and more enduring maturity than any other process, except that of the tender nursing of the mother, in the form of layers, which we have noted. The abuse of propagating-houses is in attempting to grow the vines out of season, making summer of winter; in having them so small as not to afford room for healthy growing: in suffering too high temperature, etc.

Plants from single eyes, if well made, are in no respect inferior to those grown from seed, as they very soon become entirely new wood; and plants that are started and grown for a time in pots, are much better supplied with fibrous roots than they can be in the open ground, except by layering with best care and skill.

In estimating the quality of a plant, the proper inquiry is not, How large is it? but, In how long a time was it acquiring its size? We will suppose a plant of three years to have only the size of a plant of one year. That of one year, if well grown and perfect, would be valuable, and that of three years worthless; first, because that of three years must have been damaged by defective treatment; second, because its roots must have become quite destitute of fibers, except at their extremities, and no art can restore them. We have remarked, "the vine never naturally feeds twice in the same place." From this comes the need of shortening the roots, or pruning them, as well as the shoots, at planting, and the largest often the most severely. When strong roots of one year are cut back, they readily send out numerous fibers from the cut ends, which have a tendency to form short-jointed, bearing wood that will not be impatient of restraint. Hence we see the need of transplanting and cutting back the roots of such vigorous vines as are not set in place for fruiting at one year of age. In case of cuttings, this is generally done by the winter frost, and the vine becomes reduced to the state of a cutting, nearly, with the difference that surface-wood has become root-wood, and shoots readily.

Fig 83.

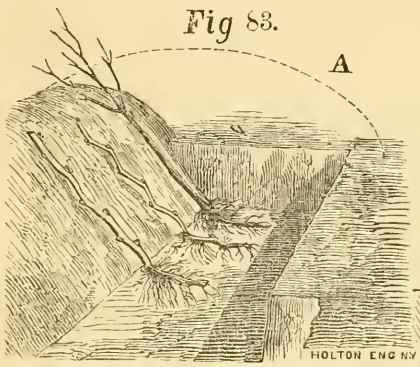
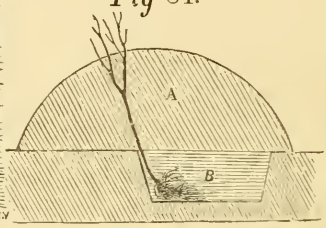


Fig 84.



We have said it is very advantageous to have the plants in the fall, near the place where they are to be set in the spring, but they are sometimes damaged by improper treatment during winter. I subjoin a plan by which all hardy trees and vines may be kept without fear of injury. It is well known and practiced by nurserymen under the name of "heeling in," but not always properly carried out by the uninitiated. A very common error consists in only having sufficient depth of covering above the roots, not considering that if the roots are above ground, or nearly so, that the frost will reach much farther horizontally than perpendicularly. Let them be covered by a mound represented by the curved line above A, reaching some distance beyond the trench, B, so that the water can not run into it. Dwarf pears, peach, and cherry trees in particular, are safely and very advantageously kept in this manner, and the advantage of fall planting gained without fear of damage which may befall any of the trees named, if set in place in autumn. Raspberry and Blackberry plants, especially, are well kept in this way, and the labor is very little. Sandy soil, and nearly as may be without vegetable mold, is to be preferred. A portion of the filling up must be taken from a little distance, so that no water may be turned towards the roots.

At Fig. 83 may be seen a trench made in dry soil (so elevated that water runs from it) about twenty inches in depth, and a bank raised by the soil thrown from it. In it may be seen a vine and a Mulberry tree, both cut back to a length of three feet. A Magnolia also, not cut back. For distinctness they are put far apart, but in practice may be put near together, fine earth being put into the interstices of the roots. A row of any desired length being put in, and the roots so covered that they are out of sight, another row may be put before, and partly above them, until by repeated rows the trench is filled. If there are but few plants, we may suppose only the number now in, and that they are to be subjected to the greatest severity of freezing. The covering of earth needed will be nearly the same as for many, as may be seen at A, fig. 84

TABLE OF CONTENTS OF

DESCRIPTIVE CATALOGUE

OF

IONA VINES,

WITH WHOLESALE AND RETAIL

PRICE-LISTS FOR 1864,

Describing and Exhibiting the Relative Importance of all our Valuable Native Vines.

CONTENTS.

PAGE

To CORRESPONDENTS, stating the advantages and importance of the new kinds—An account of the Iona stock the present season—Proposal to sell to clubs at wholesale prices, by which plan purchasers will obtain vines at very little advance on actual cost of production, and always receive good plants in perfect condition—Extent of the Iona establishment—Method of producing best vines, ... 2

Classification of our hardy vines cultivated, in six groups and four sub-groups, for the convenience of cultivators, ... 3

A full and accurate account of the characteristics and properties which constitute the value and importance of all that are worthy of attention by cultivators, ... 4

History of the seedlings Iona and Israella, . 8

Letters from Peter B. Mead, giving impressions and characteristics, with a minute analysis of the qualities of the Iona and Delaware, with their coïncidences and differences, and also his opinion of the Israella, ... 9

How to keep grapes in winter, with engravings showing how it may be easily and efficiently done. Some of our best kinds may be kept as easily as apples until spring, in full vinous life and flavor, ... 10

The quality of vines as affected by the age of the plants and different modes of preparation, and the economy of the different kinds to purchasers, with many engravings, ... 11

The value of plants according to the method of propagation, showing also how and what plants to use for clothing the trellis the first year, and obtaining an immediate production of fruit, . 16

PAGE

Selection of varieties to plant for the table and for family use, with the considerations which determine the proper choice, ... 17

Tables of selections for different latitudes for any number of plants, from six vines for a very small yard, to hundreds for a fruit-garden for family supply, ... 18

Table of selections by Mr. Mead, with the considerations which influence his choice of a selection of one hundred, ... 18

Selections for vineyards for wine, and for table use, for latitude of New-York, by Peter B. Mead, ... 19

Is C. W. Grant influenced by interest in the recommendation of kinds? 19

Extracts from letters, ... 19

Quality of grapes, and education of taste. By R. G. Pardee, ... 20

"The Conditions of Success in Grape Culture." Extract from a lecture by Peter B. Mead, . 20

The value of plants as affected by age, . . 21

Importance of transplanting and root-pruning if vines are more than one year old, . . 21

How to avoid check of growth in transplanting, 22

Are vines from single eyes, if well propagated, better than from cuttings? 22

Are vines made tender by propagation under glass? 22

Training, with many engravings, ... 24

Wine, and how to make, ... 26

Profits of vine culture, ... 27

For Descriptive Catalogue, send Ten Cents; Illustrated Catalogue, Twenty-five Cents. For both Descriptive and Illustrated bound together, Fifty Cents.

C. W. GRANT,

IONA, (near Peekskill,) Westchester Co., N. Y.

Entered, according to Act of Congress, in the year 1864, by C. W. GRANT, in the Clerk's Office of the District Court of the U. S. for the Southern District of New York.

TO CORRESPONDENTS.

IONA, September 1, 1863.

My Descriptive Catalogue for this season is all newly written, and I trust will be found to contain a large amount of information that will be acceptable to purchasers of vines.

The Grape has become not only our most excellent fruit, but the most important in value also, from the benefit and enjoyment that it is able to afford for at least seven months of the year. Those who have learned its worth do not now plant single vines of two or three kinds as formerly, when it was regarded as of little value, because ripening with great uncertainty, continuing at best but a few weeks, and while remaining was of but moderate goodness as a fruit; but a new estimate of importance belongs to it, and a winter supply is provided for.

The excellence of the new varieties, and the facility with which their fruit may be kept until spring, render the Grape of the present time the most desirable of fruits; and an important part of their value for general and abundant use in the family consists in the certainty and cheapness of production, and the simplicity of management compared with our other garden fruits.

Our best kinds are now almost universally preferred to the best productions of the cold vinery by those who have the latter in abundance, and by all who have learned their spirited excellence. The Delaware, especially, is being planted by twenties, fifties, and hundreds for family winter supply.

In my Catalogue will be found a full, precise, and trustworthy statement of the qualities, habits, and value, of all the hardy native grapes that are worthy of attention, which has never been attempted in any other publication.

Accompanying the Catalogue will often be found a proposition for the formation of clubs for the purchase of vines at wholesale rates, by means of which all who wish can obtain vines with certainty, in best condition, at prices very little above the actual cost of production, and cheaper than they can possibly be afforded in single packages to each purchaser.

MY STOCK is very large, numbering many more than two hundred thousand, and I can not dispose of all that I wish for garden planting by sending single packages to each purchaser. If the sales are made through the ordinary agencies, the prices of vines must be doubled to purchasers, for the expenses of agents are very great, and they can not live with less; but there are considerations of much more importance than the additional cost, for agents very rarely have the knowledge that is necessary to take the proper care of the plants while they are in their hands, to be dealt out in the retailing process, and they do not have at command the facilities for storage and repacking which the safety of the plants requires.

There are but few persons gifted with fine perception of the wants of plants while out of the ground, that will enable them to become good packers, with the most stringent training, and an agent does not need less qualification than a good packer. By receiving the plants direct from my packing-rooms, this serious difficulty, which has caused great loss and disappointment to buyers, is avoided.

Last season I sent out many more than one hundred thousand plants in the manner now proposed, and the operation was so advantageous to purchasers, and so satisfactory to myself, that I have determined to pursue it altogether, and trust to advertising to call attention to my wares, rather than resort to the expensive means of personal solicitation through agents. This does not preclude the action of local club-agents, to whom a very small gratuity is allowed in vines for their own planting to compensate for their duties as secretary of the club.

The express furnishes a speedy and safe means of transportation, which agents rarely employ, and the cost when divided among the members of a club, is so little for the greatest distances that it is scarcely worthy of consideration.

By receiving the plants direct from me, the responsibility is direct, and if error or any wrong occurs, it is easily and speedily righted, without cost or trouble, except to name it.

The express company has never refused or hesitated to correct an error that has occurred in the transmission of my packages, or to make good a loss.

But losses very rarely occur, and delays as rarely, except at the place of delivery, for which the receiver will do well always to hold himself responsible, for this point of express duty is not unfrequently neglected. With this last exception, I guarantee the reception in perfect order of all plants sent by express from my establishment.

Praise for the best packing has been uniformly accorded to me by all who have had opportunity to judge, both in the country and in the different countries of Europe, and still more distant countries to which my vines have been sent.

I have made the propagation of vines my special study and occupation for a great number of years, for the purpose of disseminating better plants of the best varieties than can be done by any other propagator, and on more advantageous terms to purchasers.

My vines are offered under the certainty of knowledge that they are of quality greatly superior to those that can be offered by any other propagator, and he prices are lower than the bare cost of the production of those of greatly inferior quality would have been under ordinary means of propagation.

My establishment is vastly more extensive than any other for the same purpose in this country or anywhere. The business originated with me, and all of those who are imitating it are yet afar off in the facilities which they can command for the production of the best plants, and in the quality of the plants produced, as has been shown uniformly by the results of numerous trials in every State in the whole UNION. I undertook the business because, after repeated trials by myself and others, it was apparent that without more than the ordinary means of propagation were to be used, the Delaware would not be able, until a long time should elapse, to perform its part in making this distinctively the country of the vine. And our excellent Diana was but little less in need of assistance of the same kind; for none but very imperfect plants had been produced, and those very sparingly, during a period of twelve years, and there were no promising indications of any thing better from any quarter.

After experimenting with great attention for five years, and obtaining very satisfactory results, showing conclusively, by the products of numerous trials, that vastly better plants could be obtained with care and skill, aided by proper appliances and an improved method, than vineyardists had ever conceived possible, so that vineyards at four years old would be able to give better results than Europeans had ordinarily obtained in seven; at the stage when my operations had taken a mature form, and extensive appliances and a large propagating stock had been provided at a cost of many thousands of dollars, a disastrous fire destroyed the whole. At that time numerous imitators had sprung up who, without any knowledge of the business, except what they had obtained by inspection of my operations, flattered themselves with the hope that they should be able to sell vines at very large prices, which they did not doubt being able to produce abundantly at very small cost, not knowing that to practical skill and application, great experience must also be added for the production of good plants which would bear out promises of excellence in the garden and vineyard. The most of them failed utterly, while some, stimulated to perseverance by the hope that my loss would be irreparable, were able to produce great numbers of inferior and worthless plants that have done much to bring both the kinds of vines and the manner of propagation into disrepute with some who do not make the investigation that is necessary to enable them to discriminate between excellence and inferiority.

My stock and appliances were speedily replaced, on a greatly enlarged scale, by an expenditure of more than thirty thousand dollars in one season, with very important improvements, for the production of all kinds of plants, but especially for those called "Extras" and "Best Selection," which no one has attempted to imitate.

The art of producing the best vines that will be perfect in hardihood, vigor, and productiveness, in garden and vineyard, is not only difficult of acquirement, but requires the most assiduous attention by night as well as by day; yet I have found such a degree of success practicable that the result is constant and unfailing, and I am not compelled to charge my customers for any losses or imperfections. The degree of regularity of germination and growth from the buds that I put into the ground greatly surpasses that of the best corn-field. It is brought about by using none but perfect eyes that have been produced for the purpose after a long course of treatment, by which the wood has become so perfect and enduring that it never loses any of its leaves until the completion of the season, so that the buds are furnished with the full measure of strength that belongs to them, and by treating these eyes or buds so that all of their wants are as fully supplied as if they had remained upon the mother branches. My numerous assistants perform their part under my own immediate supervision, with a spirit that springs from a love of excellence. In consequence, I am able to offer what may be represented as perfect vines at the cheapest rates.

To early Fall purchasers I offer special inducements.

For the advantages of early Fall purchases, see Catalogues, in which there is embodied such information as from very extended experience, I have found purchasers and planters to be in need of; and although named catalogues, they are a Manual of Grape Culture.

Entered, according to Act of Congress, in the year 1863, by C. W. GRANT, in the Clerk's Office of the District Court of the United States for the Southern District of New-York.

Description of all the Valuable Varieties of HARDY VINES, including a Brief Account of many that are of no value for cultivation, but are noticed because they have been recommended above their merits.

Description of Varieties.

Our hardy vines may, with few exceptions, be included in six principal groups:

ISABELLA GROUP.

Isabella,	Massachusetts White,
York Madeira,	Northern Muscadine,
Alexander,	Charter Oak,
Creveling,	Sage,
Logan,	Catharine,
Concord,	Perkins,
Hartford Prolific,	Dracut Amber,
Adirondac,	Blood's Black.

SEEDLINGS FROM ISABELLA.

Israella,	Garrigues,
Union Village,	Arkansas,
Manhattan,	Louise,
Hyde's Eliza,	Rebecca.

CATAWBA GROUP.

Catawba,	Bland's Virginia.

SEEDLINGS FROM CATAWBA.

Diana,	Kilvington,
Anna,	Cassady,
Wilmington,	Raabe,
Mammoth Catawba,	Mottled Catawba,
To Kalon,	Coleman's White.

SOUTHERN GROUP.

Herbemont,	Elsingburg,
Lincoln,	Norton's Virginia,
Lenoir,	Alvey,
Pauline,	Long.

The Ballace, sometimes called "Southern Fox," and also "Vitis Rotundifolia," with its principal variety, the Scuppernong, are not included in the descriptions. All of these varieties are too tender except for Southern climate, and none of them have proved to be valuable for any purpose even there.

Minor or Venango may represent a transition class between Northern and Southern fox grapes.

Another intermediate class may be designated as the Virginia Mountain grapes, including both black and white varieties, of which Taylor or Bullitt may represent the white, and one disseminated by Mr. Raabe under the name of Emily, the Black.

CLINTON AND MARION

Are representatives of the same class at the North, including White Clinton.

MR. RAABE'S SEEDLINGS, (so called.)

Clara,	Brinckle.

THREE WHICH DO NOT ADMIT OF CLASSIFICATION.

Delaware,	Iona,
Allen's Hybrid.	

In the following descriptions of our native grapes will be found a full and accurate account of the characteristics and properties which constitute the value and importance of all that are worthy of attention by cultivators.

I shall not give botanical descriptions further than is required to designate the habit of the vines, and in a few instances the form and character of the leaves, where it may be necessary to distinguish varieties, but shall aim to state clearly and intelligibly, with a sufficient degree of minuteness, all that pertains to the quality of the fruit, and the habit, growth, hardiness, and productiveness of all of the kinds concerning which cultivators and purchasers may desire to be informed; so that any attentive reader can not fail to form a correct judgment upon which he may act with confidence and safety in the purchase of wines.

The list of varieties which are worthy of the attention of amateurs does not comprise more than twenty, and twelve of them will very nearly afford the full enjoyment of the grape in all of its good kinds.

Those who will cultivate eight of the best varieties in sufficient number to produce grapes for abundant use, will not lose very much enjoyment by being deprived of all of the others. A very full descriptive account will be found, at the conclusion, of two new kinds, Iona and Israella, which have been added to the list this season; and it is not claiming undue importance for them in the scale of merit, to say that their acquisition doubles the value of our list of grapes for the table—or rather, for family use. They furnish, in the first place, the two varieties which possess the qualities most needed in their fruit; and the abundance and certainty with which their fruit is produced in full perfection, in the most unfavorable seasons, is a qualification so important, that its value can not be easily estimated.

While it is conceded that the chief interest of our horticultural exhibitions the past season has been supplied by the unexampled show of hardy grapes, let us consider how much, or rather, how little of that interest was sustained by the Isabella and Catawba, which twelve years since were of so much more importance than all of the other kinds together, that no other kinds received or deserved much consideration.

If those had been altogether absent from our best exhibitions this season, scarcely a grain of loss would have been felt; and this entire change has occurred, not more in consequence of the surpassing *quality* of the new kinds, than of their *unfailing constancy* of *production*, while our old favorites just named have been generally more than half a failure in quantity, besides being very inferior in their own deficient quality.

The two new ones are of the highest quality, either fresh or dried to raisins, and are not only early in their time of ripening, but excellent keepers; one being the earliest of the good kinds, and the other the best keeper among grapes. Those which have recently become our best kinds, especially Delaware, Diana, Anna, and Allen's Hybrid, are not made less valuable by the accession of these two, but THE GRAPE is made by them a much more important fruit, and must now take rank above the apple in *importance*, as well as in *excellence*, without a dissenting voice, although the apple has heretofore been justly entitled to the highest consideration.

Our varieties for all seasons and uses, and for all cultivated tastes, have become sufficiently numerous and diversified without including any that are not of unexceptionable quality, as will appear in the course of the descriptions. But still the number is not so great as to bewilder the attention, and no confusion will result if the names are not arranged in catalogical order, by which the natural groups would be separated, making much repetition necessary in the descriptions.

To take the subject according to the order in which it comes before the attention, Isabella and Catawba will be the first noticed, because these for a long time were the best, and the only kinds of passable quality known in market or in gardens, and are now more extensively known than any others.

These being so generally known, may be used and form a kind of standard for the size of bunches and berries, and color, and they will serve also as a point of departure for the description of flavor and quality.

The bunches of the Isabella are large, conic, often with a branch, which is called a shoulder, but not very properly so. Berries are large and somewhat oval, with very dark or purplish black color; the skins rather thick, and containing a pungent essential oil that is slightly unpleasant in flavor and odor, even when the fruit is in the best condition to which it can be brought by the longest and most favorable seasons. The peduncle or stalk is herbaceous and succulent rather than woody, and becomes very fragile, breaking with a slight touch after the weather becomes cool, or the occurrence of slight frost.

The structure of the berries is a favorable modification of the most objectionable natives of our woods, but still retaining in its best condition something of all their defects. It begins to ripen *near* the surface, and never ripens to the center nor often *quite* to the surface. When the process of ripening has extended into the skin, and about two-thirds of the distance towards the center, the life of the vital apparatus ceases, and no further improvement in the quality of the fruit can take place. To have the fruit in its best condition, it must be taken from the vines before the vital action of the stalks ceases entirely, but when it has just as nearly as possible performed its work. At this time it has all of the vinous life which it can possess, with as little of the pungency in its skin and offensiveness of odor and flavor as can belong to it, with its full measure of sweetness. Later the fibrous toughness of the center breaks down partially, and finally altogether; but then its excellence is lost; all of its spirit being gone, decay having begun; and the acid of the center being mingled with the sweet juice of the exterior portion then, renders the fruit spiritless and insipid; for the acid is that of unripe fruits, and not that of invigoration and refreshment. It is always rather feeble in flavor, never having sufficient vivacity and richness to make wine. The beverage which is produced from its juice never has the excellence that belongs to true wine, although it is often represented as such by sellers. The Isabella, under proper treatment, is a good grower, and endures the freezing of ordinary winters; but having thin, papery leaves, it often suffers greatly in its foliage by the changes of summer, by which the crops and often the health of the vines are lost. The fruit, under such circumstances, often acquires size and blackness without richness.

The Adirondac, a new grape of this group, was found on the shore of Lake Champlain, and has recently been introduced by Mr. J. W. Bailey of Plattsburgh. It is supposed to ripen very early, but it has yet only been grown in a very warm, sheltered nook, where the conditions have been peculiarly favorable, both for the growth of the vine and for the maturity of the fruit. Under such circumstances the Madeleine, Chasselas, and Sweetwaters, have attained an equal degree of ripeness much farther north, which has led to much disappointment in attempting to grow them in a warm latitude.

The Adirondac in character possesses chiefly negative commendations, having not much toughness or acidity at its center, and little if any of the offensive and nauseating odor that belongs generally to the group. On the other hand, it has but a moderate amount of sugar, with so great deficiency of vivacity and invigorating power that it is not easy to give it any positive character. Unless it becomes better by removal southward, and earlier than indications promise, its rank in value will not be high, for it will not satisfy those who look to the grape for such enjoyment as can be found in our best kinds. I have included the Adirondac in the Isabella group, to which it has affinity, not believing it of foreign origin.

There is but one of the old kinds that may be included in the Isabella group that is better than itself, or that will make wine, and that is York Madeira. It is medium in size of bunch and berry, with the same characteristics of structure as the Isabella, but much more rich, spirited, and pure than that, making excellent wine; but it is not very abundant in juice. It is also earlier, and ripens more perfectly. Its leaves differ in appearance from those of Isabella, but are not more hardy. There is a sub-variety of this much larger, but inferior in quality, that has been known as the Alexander. The latter name is also frequently used as a synonym of York Madeira. York Madeira has, by error or otherwise, been extensively disseminated under various names, among which are Canby's August, Hyde's Eliza, Baldwin's Early, Shepherd's Port Wine, etc.

A great number have been sent forth under different names as better and earlier than Isabella, which have proved to be simply that; among them may be named Garrigues, Arkansas, Miller's Louise, etc.

Creveling is the earliest of all the tolerably good ones of this class, and ripens nearly three weeks before Isabella. The fruit bears a strong resemblance to it, but it has a very long peduncle, and the bunches are more pointed. The Logan is not quite so early, and has a more brisk flavor, with pretty distinct foliage. In quality it may rank with the last, and needs no extended description.

Concord is not so early as the last two, and is more objectionable in its odor and flavor. In habit and foliage it is strictly like the wildings from which it sprung, having very long-jointed wood, and the characteristic rust on the under side of the leaves. Its greatest recommendations are, a good degree of hardiness, and extreme facility of propagation. It has the offensiveness of the natives in a large measure, with almost none of the pure, rich, invigorating property that gives high excellence to the grape distinctively, and the faults of the structure of the fruit are greater than those of the Isabella. Its value consists in its ripening when the Isabella will not, and in its more enduring foliage. Its habit of growth is very objectionable for both garden and vineyard, where its long canes are not easily restrained within proper space, and its very long, rambling roots starve the adjoining plants. The same description will apply to Hartford Prolific, which is one of the natives from the woods, and is a little lower in quality, but one week earlier in ripening. Both this and the Concord have but a slight attachment to the peduncle after reaching their best degree of ripening, and drop badly.

Both of these have been talked of for wine, and some persons have been induced to plant them for this purpose, but only to incur disappointment. It may be taken as a universal truth, that none but *rich* grapes can make *wine*, and that the impurity which renders a grape nauseating will not be less detrimental to the beverage that is made from it. A further consideration is worthy of attention by those who plant vineyards for making wine. Those who buy and drink wine for its benefit and enjoyment, are chiefly persons who have a fine perception of its excellence, to whom preparations from the grape just named are no more attractive than a concert of hand-organs to fine musical perceptions.

It is of little importance to pursue the descending grade any further; but some questions will be asked concerning Northern Muscadine, Massachusetts White, the Sage, Catharine, Perkins, Dracut Amber, and an endless number of others, all meaning the most offensive of the fox grapes and under almost every dingy hue conceivable except black; but this color is just as frequent as any of the others, and Blood's Black may be also named. The Hartford Prolific is just good enough to stand at the head of these instead of the latter. Perkins may represent the red and Catharine the white. None of these are new, and the offensiveness of all is very rank. Every one of them, under some other names, have been brought to notice more than once within my knowledge; but none of them can maintain any position for a moment in opposition to grapes that are truly fruit, except with a very few tastes, that find a measure of enjoyment in their very defects; but these are not persons who take much enjoyment from grapes of any kind, or make much use of them. When they do use them, in most instances, this partial liking passes into disgust as the palate and whole constitution gain knowledge of better things by the cultivation of the perceptions. "Charter Oak" is a term of opprobrium, but is only a little more of fensive than the best of those just named.

The delight which all fruits of high excellence give to those who have really learned to know them by full and free use, is only in a small degree measured by the momentary sensation which they communicate to the palate, although their worth is indicated by it; but their great excellence and power of attraction consist in the animation and vigor which they impart; in the general healthful tone which they communicate by their refreshing power, and the aid which they give to nourishment as digestives, and in the pleasurable emotions which they excite and sustain by all of these means combined, and from which their name—*enjoyment*, becomes very significant.

For this the peach, when in perfect condition, in its best kinds, is eminent, as also the citron-melon, the best of pears, and especially the best of apples; but the true grape stands at the head of *refreshing and invigorating* fruits, greatly surpassing them all.

Great numbers of seedlings have been produced from the Isabella, but none of distinguished merit are before the public, except Union Village, Rebecca, and Israella, the latter recently introduced by myself. The evidence of the parentage of the Rebecca is not positive, and leads only to a strong presumption. The Isabella is so much disposed to the production of what are called white kinds, all of which are more or less greenish, that among those which I have grown, at least one third are of that color; and many of them have foliage which is not distinguishable from the Rebecca, with fruit also strongly resembling it in appearance and quality, but in all instances retaining something of the Isabella flavor, as is the case with the Rebecca. Some are much better than the parent in quality, but more are either not better or below. A number would have been very good if their foliage had not been tender like that of the Rebecca; but they have been generally lacking in vinous spirit, besides retaining too distinct suggestions of their foxy parentage.

Hyde's Eliza is a seedling from Isabella, and may be somewhat earlier but is not better, and has not deserved the reputation that it has received from the error by which York Madeira was disseminated under that name.

Israella is very distinguishable from the foregoing, having strong and enduring foliage, with fruit sufficiently vinous and spirited; that ripens and becomes very sugary and tender quite to the center. Until the fruit has become quite ripe, the flavor is slightly suggestive of its origin; but when fully mature, it is of such purity as to have been called the "American Hamburg." The bunches are large, compact, and shouldered; berries large, globular, and very dark, adhering to the peduncle firmly, and remaining a bunch when dried to raisins.

Raisins can only be made of fleshy grapes, the substance of which all becomes elaborated into *fruit*. Such grapes as Isabella, Concord, Hartford Prolific, etc., may be dried; but the part that is fully ripened dries all away, and the part that remains unripe is, when dried, simply a mass of fibrous acidity. Herbemont being nearly all juice, (contained of course in cellular bags,) and without *flesh*, in drying leaves nothing except the skin and seeds. The Muscat of Alexandria, and the Frontignans, are fleshy but perfect fruit, and uniform to the center; and when dried, have still much substance remaining, which retains, in a concentrated form, a large part of the excellence which belonged to the fruit in its fresh condition; for examples of which see the best bloom raisins which are made of these grapes. In this sense the Israella is a fleshy grape, having fruity substance when dried, that is rich and spirited in flavor.

The Israella ripens very early; has never been affected by rot or mildew, and is one of the best for late keeping in consequence of its fleshy structure; and the vine is all that can be desired in habit, making strong, short-jointed canes, that ripen early and endure the winter uninjured.

Union Village is a very remarkable seedling from the Isabella, produced by the Shakers at Union Village, near Cincinnati, Ohio. It is very large in all its proportions of vine, foliage, bunches, and berries. The bunches have weighed more than two pounds, and the berries equal the size of Hamburgs. In flavor it is nearly pure, sweet but only moderately vinous, and becomes good quite to the center, and ripens at least one week before Isabella. It is often suffered to overbear, which prevents the wood from ripening and renders the vine liable to winter-killing. It is, under favorable conditions, as hardy as Isabella and is nearly free from its foxy defects. It is immensely productive, and always becomes one of the wonders of the garden.

The Manhattan is a seedling of the Isabella, white in color but maintaining much of the Isabella character in its fruit. It has the thin, papery leaves of the parent, and is even more subject to mildew and sun-scald. The fruit has more spirit than the Isabella, but is not without its faults in flavor and structure, which render it unfit for general cultivation.

I have left the Rebecca until the last, not because it is not worthy of consideration, but because its difference of color would at first thought place it in a class of that color; but we shall hereafter have more of this color that are of Isabella origin, and partake in the same manner of its character.

The Rebecca has been very extensively disseminated, but its habits, qualities, and requirements are not yet generally understood; in consequence of which many have been disappointed. It is not a diminutive grower, so far as the length and size of its canes are concerned, but its foliage is small, deficient in enduring substance, and suffers badly from the trials of our ordinary summers, except in specially favorable localities. The leaves often fall before either the fruit or wood become mature, rendering the first greatly deficient in spirit and flavor, and the latter with its roots tender and unable to endure the winter. It is one of the easiest to propagate, so far as the multiplication of numbers is concerned, but one of the most difficult for the production of strong hardy plants, that retain their leaves in full action to the end of the season.

The bunches are medium or small, often slightly shouldered; berries medium, often large globular, or pyriform from pressure; color light yellowish green, nearly white, tinged with pale amber when struck by the sun, with some degree of translucency, giving something of the appearance of foreign grapes. In the texture and formation of the flesh there is also an approach to the European character, becoming nearly sweet and tender to the center; and when so fully ripened that the skins become pretty thin, the juice is sweet, moderately invigorating, and with but little of the impurities of the Isabella. Even when in best condition, it always lacks the vinous spirit that is the proper constituent of a grape of very high excellence, and is never without at least a slight intimation of its foxy origin.

The Catawba is the type of a widely different group, that may be characterized as high-flavored, invigorating, and vinous or wine-making, in contradistinction from the foregoing generally feeble-flavored, spiritless, or unanimating kinds.

In form and size the bunches of the Catawba are much like Isabella, but less compact, with stronger and more woody peduncles, to which the berries remain more firmly attached. The berries have the same structure and texture, ripening from near the surface towards the center, but never quite reaching it; always having some tough, fibrous flesh at the center, which remains unripe and acid. The skins have also, even when in best condition, some pungency that offends tender mouths, and something of foxy odor; and there is also always present in the juice some tannic acid, which causes a perceptible degree of astringency. In sugar, tartaric acid, and spices, well produced and well ripened Catawbas are rich, and the juice is strongly suggestive of refreshing wine. In this the excellence of the true grape is marred by the inseparable defects named; but the vinous spirit has made it a favorite with many to whom the Isabella family have furnished no enjoyment.

Although it is much above the Isabella in quality, and commands a higher price as it is ordinarily sold in New-York markets, it is rarely if ever found there in its best condition, the climate of the vicinity not being sufficient to mature the fruit fully under the ordinary circumstances of open culture, without the strict training and severe thinning which are not often given. Excellent wine, resembling the German Hoch of high character, has for many years been made of it at Cincinnati, which is more than three degrees farther south; but that which is made and advertised as "Pure Catawba Wine," in the latitude of New-York, has never deserved the name. The defects have not been simply the want of richness and the mingling of the acids of the unripe fruit in the juice, to its deterioration, but the fine elaboration of the part next the skin, which affords the exquisite spice, not being performed by the completion of the ripening process, a harsh flavor and offensive odor takes its place. (See this matter fully treated in LANDMARKS.)

The large globular berries have often a fine, deep purple color, with a good degree of translucency that give promise of excellence, and makes it very beautiful. It is also beautiful before becoming fully ripe, when the coppery red is beginning to be veined with the streakings of violet, which afterwards soften and blend to produce the purple which characterizes its maturity.

It is of Southern origin, and requires special care in the most favorable situations, to enable it to perform well in the latitude of New-York; and it is everywhere so disposed to great loss by rot, that the high value which would have belonged to its excellence of quality, has been greatly lessened, and it is now being rapidly superseded by better, as well as more hardy kinds. A grape called Bland's Virginia, of the same character of fruit, but better in quality, was introduced many years since; but its foliage was so tender that its cultivation has not been extended even in gardens. Bland has less fibrous toughness than Catawba.

The Diana, a seedling from Catawba, is a great improvement upon the original in every respect. The vines are much more hardy, and the fruit ripens two weeks earlier, with purer, richer, and even more spirited flavor. Its bunches are large and compact; the berries are often very large, but when suffered to overbear, they are often not quite so large as those of Catawba.

The fruit begins to become transparent and to commence ripening very early, and soon becomes pretty good, but with some degree of offensive odor and flavor. As the ripening progresses these disappear, and that which constituted the great thickness of the skins, by complete elaboration in ripening, gives the peculiar spicy richness that characterizes this variety, leaving the skins very thin and the flavor exceedingly rich, spirited, and pure. The Diana bears very early, and its first produce contains only promises of its mature excellence. It is greatly disposed to over-production and to excessive vigor of growth when young, and consequently requires removal of its excess of fruit as soon as it has set, and a judicious course of training, which will enable it to give full exposure of all its leaves to the sun, that its wood may be matured. When the vines have attained sufficient maturity for bearing they readily take a very compact habit, by which they are adapted for any good system of training, under which they do not fail to ripen abundant crops constantly. Where its habit and wants are not understood, and the canes are permitted to crowd each other, neither wood nor fruit can ripen satisfactorily. The proper treatment is shown in ILLUSTRATED CATALOGUE, and more fully in LANDMARKS.

It is one of the indispensable varieties, from its assemblage of good qualities, ranking next to Delaware and Iona in value, and in its proper latitude may advantageously constitute a portion of every vineyard, either as a grape for the table or for wine. When well managed its bunches and berries are large and beautiful, having a fine transparent wine color, marked with white stars, and covered with a fine bloom. Its excellence is becoming more apparent from the development of each succeeding season. One noted cultivator has been so struck with astonishment at its excellence that he has named it "Eureka." For late keeping it is one of the very best; season of ripening more than a week, or nearly two weeks before the Isabella, and quite as early as Concord. The originating of this variety, by Mrs. Diana Crehore, of Milton, Mass., marks one of the important events in the history of American grape culture.

The Anna is a white grape, produced in the garden of Mr. Eli Hasbrouck, of Newburgh, Orange County, N. Y., and has sufficient resemblance to the Catawba, in habit, and appearance of wood and foliage, and also in the character of the fruit, to leave no doubt as to its parentage.

The foliage, in addition to its strong Catawba character, has a peculiar marking, or mottling of yellow, in the early part of the season, that often leads careless observers to the belief that it is very liable to attacks of mildew, whereas it is one of the most hardy to resist, and these marks appear long before the season of mildew.

The bunches are large, moderately compact, generally shouldered, (branched,) berries large and globular, with very little translucency until the commencement of ripening, which is ten days before the Catawba begins to color. The fruit begins to be sweet as soon as it shows any transparency, but requires a full season to acquire its best degree of ripeness. One of the characteristics of the Catawba family is the imperfection of the produce of very young vines, of which the Anna fully partakes; but as it acquires age the fruit ripens early, and so perfectly, that very little toughness, and scarcely a vestige of acidity at its center remains. In pure, rich, vinous, and invigorating flavor it is not equaled by any hardy grapes, and scarcely surpassed by the Muscat of Alexandria.

The stalks are strong and woody; the berries adhere firmly to the bunch; the flesh is somewhat meaty, drying readily to raisins, without any disposition to decay, and it is one of the best for very late keeping. The remarkable invigorating spirit of its extremely sugary vinous juice renders it very acceptable to persons suffering from debility.

Wilmington is a white grape, of spirited Catawba flavor, that ripens rather late but becomes good to the center, and for latitude south of New-York may become of some importance.

Mammoth Catawba is a white seedling, raised by Mr. Mottier. It is not equal to the parent in quality, being coarse and fibrous in texture and more foxy, but is of enormous size, as its name indicates.

To Kalon is another seedling from Catawba, of very distinct character in foliage and fruit. The leaves have a ruffled appearance, caused by the overlapping of their alæ, that is very common among European kinds, but is scarcely found besides among our natives.

In habit it is strong, compact, and healthy; but the leaves sometimes fail, and the fruit often suffers badly from "rot." The bunches, when perfect, are large, the berries are also large, globular, with a peculiar dark purple color, and some degree of translucency. It is earlier than Catawba, and when in best condition ripens quite to the center, and retains no vestige of the fox. The flesh is buttery, rather than flowing with juice, which is pure, sugary, and sufficiently vinous, but little spicy, and not particularly refreshing. The disposition to rot detracts greatly from its value.

Kilvington is another Catawba seedling, so like its parent as not to require a separate description. It is earlier and more tender in its structure, and it appears to be more pure in its flavor, but has not been sufficiently tested to have its qualities precisely ascertained.

Cassady is a white grape of doubtful parentage, but possesses much of the Catawba vinous spirit, and deserves to rank among the good kinds where the climate will ripen it, which is about the same as is required by the Catawba.

Raabe is a seedling of Catawba, that has been long before the public, but is yet but little disseminated. The bunches and berries are small, but the quality is excellent, the grapes ripening quite to the center; of a uniform, fleshy, but tender consistence, sugary, vinous, and spicy, pure, and very rich. Its foliage is strikingly like that of Catawba, and the fruit, like it, often suffers from the "rot."

There is a Mottled Catawba, raised by Mr. Carpenter, of Kelly's Island, which resembles the Catawba in all general characteristics except that the ordinary Catawba color of the skin is mottled with lighter colors, as its name implies. There are some others not yet fully before the public, but not any of great promise.

There are two white grapes of recent introduction, that do not readily fall into any group, but may be briefly described separately. These are Cuyahoga and Maxatawney, the former of which originated in the grounds of Mrs. Wemple, at Collamore, not far from Cleveland, Ohio, and the latter near Philadelphia. It appears that the grape which had been known for some years as Coleman's White is identical with the Cuyahoga; and if so, injustice was done to purchasers, for good plants of Coleman's White were to be obtained at moderate prices, while large prices were asked for the most worthless plants of the so-called Cuyahoga that were ever sent out.

The Cuyahoga is a medium bunch, with large berries, considerably translucent, and with very little toughness or acidity at its center. It is sugary and vinous, with a peculiar flavor that is often prized.

It is very readily propagated, and grows finely, but the leaves do not appear to be very hardy, and but very little is known with certainty as to its productiveness or time of ripening. It is claimed to be earlier than Isabella.

Maxatawney is spirited and vinous, but ripens too late for a latitude north of Philadelphia, except in very warm situations.

There is a remarkable group of Southern grapes, of which Herbemont may be taken as the representative, which have none of the characteristics of the American Fox grapes, either of the North or South. These have thin skins adhering to the flesh, which is tender and good quite to the center, and without pungency or offensive odor. All of them are pure, rich, vinous, and excellent in flavor, and have a general resemblance to the Pineau family of Europe, from which it is by many supposed they may have originated by seeds that were brought perhaps as early as the time of Sir Walter Raleigh. This opinion has no better foundation than conjecture, aided by the character of the fruit which affiliates with none but the European kinds.

The original "Herbemont's Madeira" is still growing near Columbia in South-Carolina, but vines of the same kind had been known at Warrenton, in Georgia, some years before the particular vine from which Mr. Herbemont took his cuttings had been spoken of, and possibly it may have been introduced from Georgia. It is, perhaps, the most rampant grower of all the vines known, but with a very close, short-jointed habit and abundant foliage, that endures our seasons very well, despite its European appearance. The canes are very large and smooth, with beautiful violet color, thickly covered with waxen bloom. At first bearing, the bunches are not very large and the berries are extremely small; but with mature age, the berries become almost medium in size, and the bunches very large and double-shouldered. The

color is dark blue, a little tinged often with violet. The berries are almost without flesh and full of clear juice that is sufficiently sugary and very briskly vinous, spirited, and refreshing. It makes very delicate and pure-flavored claret wine, but having scarcely a trace of tannic acid it is not enduring, and is disposed to acetous fermentation.

Foreigners who eat these grapes pronounce them excellent, and able to take a high rank in flavor when compared with their own good kinds, and some of our own people find in them a degree of invigorating refreshment which they can not obtain from the more luscious, sugary kinds. One or two vines on a pretty large trellis will add greatly to the value of any collection where they will fully ripen. Its season is perhaps one week later than the Isabella, but on the south side of a wall, fence, or building it will ripen constantly at least one degree north of New-York, and in warm localities still farther.

For ornament, and especially for covering the south or south-easterly side of a house or building, these vines are well adapted by their beauty, and in such situations none are more constantly productive. It is well to lay the vines down in winter, although their thoroughly ripened wood is able to endure severe freezing.

Lenoir, of the same group, is a native of the mountains of North-Carolina, and differs from the Herbemont in its foliage and also in the smaller size of its bunches and less vigorous growth. The fruit is also more sugary and makes enduring wine of very high character, that is not less delicate and pure in flavor than that of the Herbemont. It ripens more than a week earlier, and the grapes are not less excellent for the table. The berries are rather small, very juicy, rich, and tender quite to the center, with a spicy Pinot flavor; bunches compact, not large, but handsome.

Lincoln is another of the group, and for general cultivation is the most valuable of the class, being very productive, ripening early or considerably before Isabella, with all of the purity and sugary richness that belongs to the best of the Pinots. It is excellent for the table, and makes wine that is second to none in purity and delicacy of flavor, while in richness it greatly surpasses Catawba and approaches the Delaware. The wine keeps well and improves by age.

Pauline is one of the richest, most spicy, and excellent of the group in flavor, but has not been tested thoroughly in the Northern States, so that it is now impossible to state precisely its time of ripening or degree of hardiness, but it may be supposed in these respects to differ but little from Herbemont, which is the case at the South. It has a peculiar color of mingled copper and violet, and is said to be only moderately productive, which is saying its bunches are not large in proportion to its canes, for all kinds produce their three bunches to each cane.

Alvey may be classed with these in purity of flavor, tenderness of flesh, and general appearance, but in briskness and moderation of sugar it resembles Herbemont. Its berries are larger and bunches smaller, but it ripens earlier.

Elsingburg, by its tenderness to the center and purity of flavor and by its general appearance, may be classed with these, but it is still quite distinct from them, yet has not any relationship to the wild grapes. It is extremely rich, sugary, spicy, and spirited, and bears some resemblance in its flavor to the exquisite Schiras, and might be expected to make wine like Hermitage. It has not been tested for wine, but no doubt can be entertained as to its excellence for that purpose. It is hardy, not disposed to rot or mildew, and ripens one week before Isabella. Bunches large, and berries small and very black.

Norton's Virginia and the Ohio Segar-box do not require separate descriptions. Long is like Herbemont, but later and less valuable, failing to ripen even in Georgia, from the crowding of the berries on the bunches.

The Minor or Venango is a fox grape from which wine has been made, but it is not sufficiently valuable to be retained on the list for cultivation. Bunches medium, compact, light copper color; ripens rather early, and has all of the ordinary characteristics of the foxes, except that the attachment to the bunches is pretty strong.

There is a class that includes both black and white that have been designated Virginia Mountain grapes, of which the Taylor or Bullitt may be taken as the white representative. The flavor is tolerably good, but the bunches are generally small and it has not a sufficient degree of goodness to entitle it to continuance on the list for cultivation, and the black ones have still less merit.

Clara is a white grape of foreign characteristics that has been on the list for some years, but is not of sufficient value to rank very high by the side of the Delaware and Iona. It is pure and rich, ripens sufficiently early, but does not promise to be very productive under ordinary circumstances.

Brinckle, if a seedling, is of the Pineau character, and not better adapted for our climate than any of the foreign grapes of that class, being subject to mildew and not equal to Lincoln and Pauline in quality.

Of Rogers's Hybrids too little is known to admit of precise description. No. 7 resembles Minor in appearance and quality; Nos. 11 and 19 are large black grapes, of not more than tolerable quality; and Nos. 1, 4, 5, 9, 14, and 31 may be taken as favorable specimens of the whole. I do not think the proof is clear and beyond doubt that any of them are hybrids, and further evidence of merit is necessary to place any of them among our standard kinds.

The Delaware grape is easily praised in the warmest terms, but it is still the most difficult of all to describe truly, because in its most essential characteristics it has no very near analogy in any other fruits. Of the character and habit of the vine it is also difficult to speak so as to be perfectly apprehended, because the peculiarities in which its exceeding value consists are not those to which value is generally attached. Its close short-jointed habit, with very hard wood of only medium or small size, are often contrasted with the gross long-jointed wood of the coarser kinds, to the disparagement of the Delaware; whereas in this consists the strongest point of excellence—the habit of the vine rendering it easy of training in any desired form, with the most hardy and enduring character after establishment in bearing, in which important conditions those of grosser porous habit are always deficient.

The Delaware has so good a degree of vigor that more is not desirable, and is unsurpassed in the abundance and active, hardy, enduring character of its foliage, which, in addition to excellence of quality in its fruit, is the most important point in vines. Unless the vine possesses both in an eminent degree, its value can not be great, and in both of these respects the Delaware is unsurpassed, and it may be said, is unequaled, especially as a grape for the vineyard for wine-making. Its wood is harder and heavier than that of any other vine, and it surpasses all others in hardiness. Its growth is sufficiently vigorous, and it delights in generous treatment, which does not render it less enduring or impair the quality of its fruit.

At first bearing, and especially when the ground has been excessively enriched, the fruit has something of foxy odor and an injurious degree of tough unripeness at its center, but on mature vines that are not permitted greatly to overbear, the fruit becomes sweet quite to the center, but is never without that meaty consistence which constitutes the flesh of raisins. In pure, rich, spicy, vinous flavor, abounding in sugar, the Delaware is not surpassed by any grape foreign or native, and is only equaled by some of the small foreign kinds, like White Riessling, which have not half the productive ability of the Delaware. Its bunches are compact and very symmetric in form, having a branch like Isabella and Catawba, which is called a shoulder, with its berries firmly adhering to the woody peduncle.

The berries have a great degree of transparency from the beginning, which increases until the period of ripeness, when the clear transparency of their beautiful peculiar color renders the uniformly perfect bunches exceedingly attractive in appearance, and withdraws all attention from the opaque kinds, whatever may be their size or quantity.

Under the training and management adapted to its habit, its bunches and berries become of good size, and there is no kind more productive by weight, and no vine that sustains itself so well against injury from over-bearing, to which it is almost constantly subjected.

It ripens very early, or about three weeks before Isabella, and at any given time is better for eating than the earliest of the coarse black grapes, including Hartford Prolific, which is perhaps the earliest of its class. The pure rich delicacy of its wine as greatly surpasses that of the Catawba as does the character of its fruit. When tested by the saccharometer it maintains the same preëminence that is always awarded to it by the palate, and in consequence of the fineness of its flesh, destitute of coarse, unripe fiber, ten pounds and a half will yield a gallon of wine, for which at least twelve pounds of the most fully-ripened Catawbas are required. The fruit is one of the best for late keeping, and does not decay or lose its spirit, but dries readily to

raisins, which, when sufficiently dried, maintain the Muscat meaty character without any diminution of transparency. I am not acquainted with any grape among the foreign kinds that comprises so valuable an assemblage of excellences, and we have none among our own, except Iona, that can be placed by the side of it, although Diana is one that we can not spare from our list for garden or vineyard.

Iona is a seedling from Diana, and has none of its defects, with a large amount of excellence peculiarly its own. The vine is of best habit, being strong, vigorous, and hardy, with large, short-jointed canes and abundant thick, fleshy, and enduring foliage, which remains until both wood and fruit are fully ripened. It flowers and sets its fruit late, but matures very early, and thus avoids danger from late spring and early autumn frosts. It bears very early and abundantly, giving excellent fruit that is tender to the center at first, but improves in spirit, sugar, and richness as the vines acquire mature age. The berries are large or very large, and the bunches very large and winged or double-shouldered like the European grapes, and the berries are remarkably transparent from their first setting, which is indicative of the tenderness of the flesh. The color is peculiar, but is sometimes seen in the Catawba when its coppery hue becomes almost crimson, with minute veinings of violet or amethyst.

The same is often seen in what is called the Grizzly Frontignan, which the Iona strongly resembles both in appearance and flavor.

The structure of the berries is uniform from the circumference to the center, melting under a slight pressure from the tongue, and when fully ripe flows with most abundant clear, vinous juice.

In flavor it is rich, spicy, with a fine, delicate, muscatel aroma added to its sugary and refreshing wine, constituting it one of the most delightful and refreshing of grapes. For late keeping it is fully equal to Diana, and is not in the least disposed to rot or lose its vinous spirit, but dries readily to the most spirited of raisins, for which it is admirably fitted by having only a few very small seeds, as well as by its tender, *meaty* structure. From its early bearing and extreme productiveness, and the certainty of its crops, as well as from the character of its fruit, it must become equal in value to the Delaware and superior to all others. It has not been tested for wine, but can not fail of taking a high rank for that purpose. On another page its history and characteristics are more fully stated.

Allen's Hybrid is the only grape that bears in itself full proof of hybridization. The Isabella was its mother, and which of the foreign kinds furnished the father is doubtful. It has all of the excellence of Golden Chasselas, with much more vinous spirit and refreshment. It is nearly white in the shade, very translucent, and fine light amber when sunned near the time of ripening. It has very peculiar leaves, which have great ability to withstand mildew, and appears to be quite hardy, but may be for safety laid down in winter. It is strong, short-jointed, and vigorous in habit, and bears early and abundantly. The bunches are large, sometimes branched like Isabella and sometimes shouldered like foreign kinds. The time of ripening is not yet fully ascertained, as it appears each season to become earlier, and may perhaps surpass the Delaware. By laying down in winter it will probably be one of the best for the North, where it will be entirely exempt from mildew and blight. Each year gives additional evidence that this is one of our most esteemed varieties for the garden.

The *Iona* and *Israella*, after six years of thorough trial in different localities, have uniformly exhibited great excellence, and shown themselves, all things considered, to be superior to any native kinds in cultivation.

The Iona, in particular, for table use, will mark an era in American grape culture not less important than that so happily distinguished by the introduction of the Delaware, which has wrought an entire revolution in our ideas of the characteristics of a good grape.

The former idea, as shown by the Isabella, and even by the Catawba, to some extent, even under the most favorable circumstances, and when in the best condition, was that of a considerable amount of goodness always inseparable from some degree of badness, which made a very broad distinction between the best European kinds and those of our own country, greatly to the disparagement of the latter.

The present idea is that of unmingled goodness, with a degree of restorative, inspiriting excellence that belongs to no other fruit. In the presence of the grape, we can not characterize the juice of the noble apple as "blood," which we may now do in speaking of the animating juice of the best of our own grapes.

The Iona is a large bunch, with large berries of a very peculiar wine color, a little tinted with amethyst, and is translucent from the first setting of the fruit, like the best European kinds; the bunches are also "winged" like those, that is, shouldered on each side, instead of being branched like the Delaware and our other native kinds. Its seeds are few and extremely small.

The flesh is of uniform consistence quite to the center, and as sweet at the center as near the skin; in quality and appearance it more nearly resembles the Red Frontignan than any other grape. Like that most esteemed Muscat variety, it is transparent, fleshy, tender, and is even more spirited and vinous, and makes more spirited raisins. It does not decay, and may be kept all winter on the shelves of the fruit-room, adhering firmly to the bunch, and at length dries to raisins.

It is an early and profuse bearer, never having failed to fully ripen its crop, and has never been affected with rot or any unhealthiness during its trial, even in the most unfavorable seasons for the grape that we have ever known. The third year from the seed (1857) it bore and thoroughly ripened many fine bunches.

The habit of the vine and the quality of the fruit are both so good, that it would be difficult to say in what respect they could be altered for the better.

It ripens fully two weeks before the Isabella, hangs long upon the vine, and is not injured in its flavor or texture by severe frost. Flowering late, it avoids danger from spring frosts. It has none of the offensive native muskiness, but a genuine, delightful Muscat flavor, and with its spirited richness, it may be inferred that it will take as high rank for wine as for the table, although it has not been tested for that purpose.

The ISRAELLA is a large black grape, ripening one week before the Iona, and is the earliest black grape that is large, excellent, and hardy.

Like the Iona, it adheres firmly to the bunch, is a late keeper, and dries early to raisins, which are sweet and rich. It matures from without toward the center, and when fully ripe, has no acidity or toughness remaining, being exceedingly sweet, rich, and good throughout its entire substance. It is somewhat suggestive of a spirited Green Gage plum by its peculiar luscious flavor. It is not deficient in vinous life, and is pronounced most excellent by all who have eaten it.

The vine has uniformly maintained its remarkable health and hardihood, and, during the five years of its fruiting, has been constant in its exceeding productiveness. It has never been affected by mildew, nor has the fruit suffered from "rot."

The Iona and Israella, at first fruiting, stood out from a great number of seedlings very prominently for excellence of flavor, and the hardy endurance and productiveness of the vine.

A few words in regard to the origin and history of these vines may here be added. The years 1850–54 inclusive were very favorable, by their heat and dryness, to the growth of the vine; in 1854, however, there was some thinning of the crop by the rot among the Isabellas and Catawbas, but scarcely a show of it among the Dianas, which had that season arrived at a good degree of maturity, and excited my surprise by the size, beauty, and excellence of the fruit.

I determined to plant all of the seeds from that kind that could be saved; and the remarkable excellence of the Isabella and Catawba grapes that season, surpassing any thing that I had before seen from those kinds, suggested the idea that circumstances were opportune for planting seeds from the best and earliest ripened bunches of these also.

They were planted in ground that had been trenched two feet deep or more, and the roots of the best of them occupied the full depth of the worked ground, and without any protection, endured the severe freezing of the winter that followed without injury.

I transplanted five thousand of those which promised most by their hardiness, vigor, and nearness of joints, rejecting the long-jointed.

The next season was particularly trying to the leaves, by its sharp alternations from cloud and fog to wind and fierce, bright sunshine. The leaves of many suffered greatly from sun-scald, and for this tenderness two thousand were rejected at the end of the season.

The Iona stood out very distinctly above them all, having produced two canes that appeared to be large enough for bearing, which were pruned for that puppose.

The result more than realized the pretty high expectations that had been indulged, and a small stock was propagated from it by layering, which greatly exhausted the mother-plant. All of this stock was lost the following winter by a destructive fire, by which I lost houses and a large stock of plants which were in a pit adjoining.

At four years old many of them showed great excellence, by the production of fruit better than Isabella and Catawba; but meanwhile the standard of excellence had greatly advanced, by the dissemination of the Delaware and Diana, so that qualities which would formerly have been valuable had happily ceased to be so, by the advent and dissemination of these.

Of those which bore fruit at four years old, one, now named Israella, very clearly stood far above all of the others in the assemblage of good qualities which constitute an excellent and valuable grape, although there were six others of great excellence, and so good that I can not now permit them to be lost. Unless, however, farther advance in the maturity of the vines shall exhibit an increase in valuable qualities, these will not come before the public as articles of commerce. Our collection of grapes is not to be made more valuable by adding to it such as are nearly as good as the best, without some important quality in which they excel; but additions, to be valuable, must possess all the good qualities in an eminent degree, with some valuable characteristics superadded.

With Iona and Israella added to Delaware, Diana, Allen's Hybrid, Elsingburg, Lincoln, Lenoir, Herbemont, and Alvey, we have a list of ten, all of excellent quality for the table, when tried by the highest standard of foreign grapes, with all of the variety in character and flavor that can easily be supposed to belong to that number of varieties of hardy grapes.

I might here present hundreds of testimonials from the most respectable sources, but the one from Mr. Mead will suffice for the present. He has tested it, perhaps, with more critical nicety than any other person, and his judgment will not be disputed by any one. His letter covers the whole ground of interest in regard to a grape.

NEW-YORK, September 1st, 1863.

DEAR DOCTOR: I am very greatly pleased to learn that the Iona is at last to be sent out. I am pleased, not only on your account, but on my own and that of the public. I am released from a certain restraint which it is not always pleasant for an editor to be placed under, that is, of saying just what I please. Now it would have greatly pleased me, many a time, to say publicly, and without circumlocution, how highly I prize the Iona grape; instead of which, I have used figures of speech and uncertain allusions. You may have guessed when the Iona was alluded to, but others could not. It is my firm conviction that a man does both the public and himself injustice in announcing his wares prematurely. I think, therefore, that you have acted judiciously in having said so little about the Iona, but occupied your time more profitably to yourself and the public, in thoroughly testing its characteristics as a good grape.

You have acted wisely, also, for your own reputation and that of the vine, and justly toward the public, in delaying to propagate plants for sale until you had grown strong, mature wood from which to take the eyes for propagation, thereby securing plants of the best quality for first sending out, which is an important consideration that has been too often disregarded.

I shall have occasion to congratulate the public in being put in possession of a grape of such marked excellence. You may remember what I said of the Iona when I first tasted it at your Island, several years ago. I have tasted the fruit every year since, and I have grown the vine. My first impressions are fully confirmed. You know I always give my opinion quite candidly. It is hardly necessary to tell you what I think of the Iona. It is worthy to take its place by the side of the Delaware. That you will probably esteem pretty high praise; and such it really is. There is one point, however, in which I must give the Delaware the preëminence: I think it surpasses the Iona in the extreme sugary richness of its juice; but then how very eminent the Delaware is in this respect! The Iona, however, has its counterbalancing qualities, and possesses in a high degree more of the important points now looked for in a good grape than any yet brought before the public. It is a healthy and vigorous grower, making nice, short-jointed wood, with thick, clean foliage, is perfectly hardy, and ripens some time before the Isabella. That is its character with me. Then the bunch is large and the berries are large, the latter being nearly transparent. The color is beautiful, being almost amethystine. The flesh is tender and melting to the center, sweet and vinous, with a decided Muscat flavor; and it is the only native grape that I have seen that has it. I have several times told you that it looks and tastes much like the Red Frontignan, and the transparency of the berry helps the illusion. I shall advise my friends that they can not plant too many vines of it.

I am glad to learn, too, that the *Israella* is to be brought out. I ought to feel some interest in it, for it is the grape that I selected among all your very early kinds, and named after Mrs. Grant; and I am sure I would not name any but a very good grape after her. It is not so vinous as the Iona, but it is melting, juicy, and very sweet. The bunch and berries are both large. It is better than the Isabella, and I should think three weeks earlier, as I have seen it at Iona Island. Its early bearing and great productiveness I hope will prove to be a permanent characteristic of it. I can not speak so confidently of the habit of the Israella as I can of the Iona, as I have not yet grown it; but what I have seen of it during the past three years, leads me to think highly of it in this respect, and I must beg of you for one of the first vines sent out. Feeling the interest I do in the introduction of really good grapes, I could hardly do less than congratulate you, as I will any other friend engaged in the same good work.

Sincerely yours, PETER B. MEAD.

NEW-YORK, October 5th, 1863.

DEAR DOCTOR: The Iona has taken the first prize for the best seedling grape at the New-York Grape Exhibition, for which I congratulate you. Knowing the Iona as I do, it would have been matter of great surprise to me if it had been otherwise.

You will have observed that I place the Delaware and Iona side by side. In doing this I have no idea that either will supersede the other; I only wish to have you infer that the Delaware and Iona are my favorites, and that I consider both indispensable. While they differ greatly from each other, both are most excellent in their way. In an important sense they are the complement of each other, and give us, in variety for the table, with great certainty, something that will satisfy a very nice taste, even though it has had a "foreign" education.

Both are very sugary, rich, vinous, and spicy, but the Delaware is the most concentrated. The Iona is the Delaware enlarged, with a greater degree of melting tenderness, perfectly uniform to the center, with a distinctive flavor. The Delaware is among grapes what the Seckel is among pears, an exquisite refinement of them all, with a flavor peculiarly its own. The Iona, to continue the simile, may be likened to the White Doyenné in its best estate, not so extremely rich and concentrated as the Seckel, but with an equally pure, spicy, vinous flavor, a little diffused in a larger size, and, to use one of your own expressions, full of "refreshing enjoyment," to which constant indulgence gives increasing zest, but never cloys.

There is in them all a happy commingling of the "sweet and sour," with a spice added to the vinous spirit of the grapes, that makes them most delightful to the palate, and more invigorating to the system than any other fruit.

I could carry the comparison still further, and show that, by their effects and in their flavor, they are essentially wine in their character, having its excellent generosity without its alcoholic stimulation, which restricts the use of the latter to particular ages and conditions, while the full advantage and enjoyment of good grapes, such as we now have, may be freely extended to all, even to the most delicate, and particularly to children.

I am too much pressed by business to pursue this interesting subject further, but will only say in conclusion, that I shall increase my allowance of grapes from five to ten pounds a day — five of Delaware and five of Iona — as soon as I can get them. One word more: we are now able to sympathize with Europeans of the grape countries, who have spoken so warmly of the benefits of the "Grape cure," by which those who are well are made better, and those who have become debilitated beyond the aid of medicine or ordinary curative regimen, are restored without resorting to any more disagreeable remedy than a plentiful diet of rich, vinous grapes. I have recently felt their restorative power very markedly, and seen their good effect in children. One advantage will not be forgotten: there is not often much difficulty, after the first dose, in getting the patient, of whatever age, to take the medicine freely. Yours truly, PETER B. MEAD.

TO KEEP GRAPES FOR THE WINTER.

The indications are very simple and easily fulfilled, when a room for the purpose can be had on the northerly side of the house, out of the influence of fire and sun. In an equable temperature of about forty degrees, or a little lower, in a rather dry atmosphere, the late keeping kinds remain for a very long time with scarcely a perceptible change, if the air remains nearly immovable. In a freely ventilated room they will, after a time, begin to shrivel, and at length dry to raisins. A moderate freezing affects them but little if the process of thawing is very gradual; but repeated freezings break down their texture, and lessen the refreshing property.

The indications then are a rather low temperature, but above freezing; very little movement of the atmosphere, and only a moderate degree of moisture.

After the establishment of cold weather, in the fall, a dry cellar that

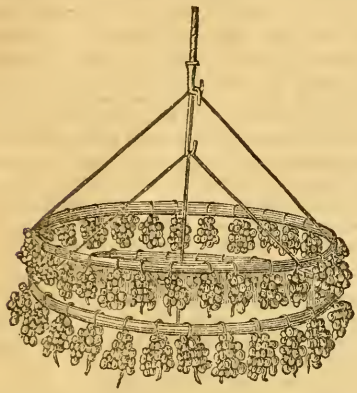


Plate No. 1.

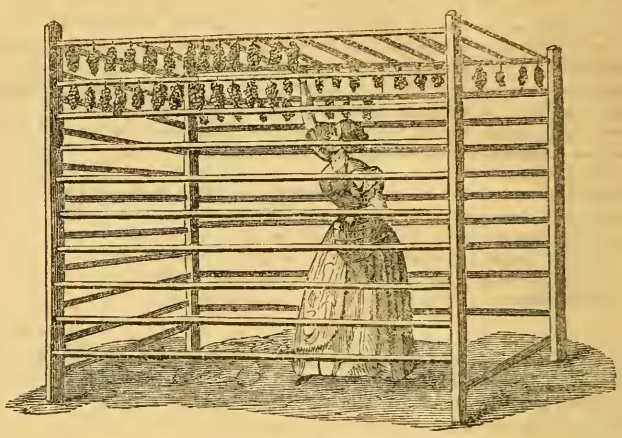


Plate No. 2.

admits of a little ventilation when needed, but where no mold or fungi are permitted at any season, is all that can be desired. If the cellar is used for general storage of fruit, the grapes will be perfectly accommodated in just such circumstances as will be best for the apples, but more nicety is required for the grapes, in consequence of their berries being smaller. The degree of excessive ventilation that would cause some shriveling of apples, would have more effect upon the grapes. If the apples are kept perfectly, the grapes will be also. Grapes must not, for very late keeping, be piled upon each other, and when a quantity is to be stored, the easiest method is by suspending them just far enough apart to prevent touching each other. For small quantities a set of hoops may be used, as shown in the engraving, using hooks of small wire for attachment,(Plate No. 1.) When large quantities are to be kept, frames with movable bars are used, with wires for attachment, as before stated, (see Plate No. 2.) When not more than two or three hundred pounds are to be stored, a miniature fruit-room or fruit-case

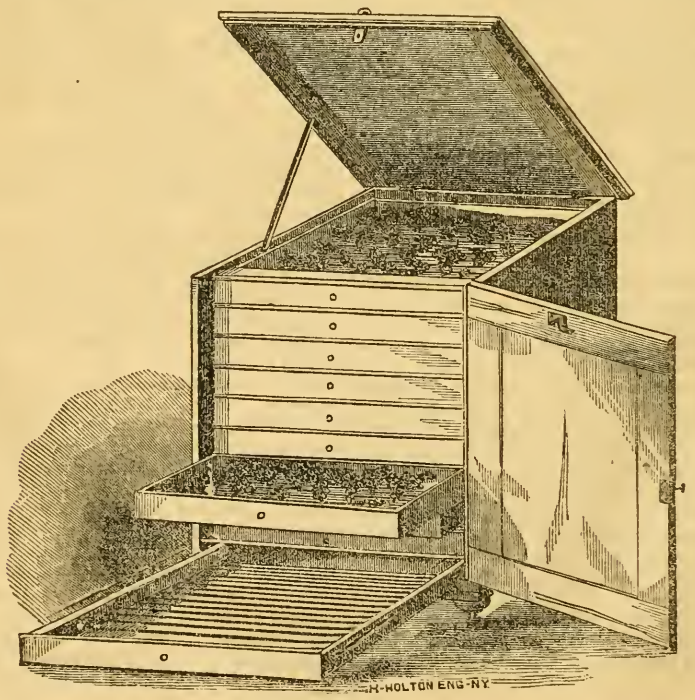


Plate No. 3.

affords the necessary appliance. The most simple of all is a box of any depth from six to twelve inches, which can be made very close. If only six inches deep, it will admit but one layer of bunches, to be laid only so near each other as just to touch without pressure, or better, with a slight space between them. If the box is nine or ten inches deep, it will admit two layers, but the upper one must be separated from the lower by a bed of slats let down half the depth of the box. A box two feet and a half long, eighteen inches wide, and ten inches deep, will accommodate seventy-five or one hundred pounds. The bed for the upper layer may be conveniently made of ordinary laths, separated one fourth of an inch, or less, from each other. The grapes may be supposed to be gathered in the fore-part of a dry day in October, after the dew is thoroughly dried from them. Every green, wormy, or imperfect berry should be carefully removed by cutting with a sharp-pointed scissors through the pedicels, as is done to prepare them for market, being careful to handle them so as not to remove the bloom. That is a wax covering for their protection, and is needful before and after ripening.

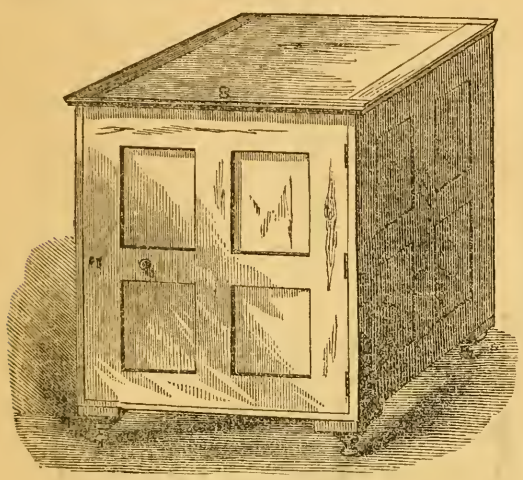


Plate No. 4.

After the bunches are all prepared, lay them carefully into the box, on paper, and when the box is filled, set it into the cool room, to remain all day without the cover. At evening, put the cover so that it will, at the front edge, be raised up about one inch. Let the cover remain in this position until the cool weather of November is established, when it is to be fastened down closely, to remain until opened for examination, or to take out the grapes for use.

The success of the performance depends upon the perfection of the fruit, the care in handling, and the suitability of the room in which the case is placed. The north room of an ordinary dwelling, or any other room made equally cool, affords a good reception for the box; but it must not be warmed to summer temperature by the sun or any artificial heat, even for a little time. The more nearly closed the boxes may be before the final shutting up, the better for the grapes.

A much more convenient cabinet may be made with drawers, and the cost for one of sufficient size, to contain two or four hundred pounds, will be very little in proportion to the worth to be obtained.

Such a case is represented in the engraving. Instead of trays with slats, as directed when boxes are to be used, drawers are to be made of the same structure, about four inches deep, or of sufficient depth to admit the bunches. The case represented in the engraving (Plate No. 3) is four feet high, three feet wide, and two feet deep, and will contain about two hundred and fifty pounds. The cover is movable, as shown, to be left open and closed as directed for the boxes. The drawers need no separating piece between them, the ends being less than the hight by half an inch, to give room for the slides. The door in front must be kept closed after the cold weather is established, and if the room admits of freezing, a bed-quilt thrown over the case will be sufficient protection. In February, thorough examination should be made of all the drawers, and any imperfect berries that may be found, must be carefully removed, and no free moisture permitted to remain.

If a long series of warm days should occur in January, some ventilation may be necessary, and also an examination for the removal of defective berries.

The cabinet is represented as closed, in Plate No. 4, in which condition it is to remain, except when opened for purposes named. It may be enlarged by additions to the hight and width. None but the late-keeping kinds are fit subjects for treatment. The Iona, Anna, Diana, Israella, and Delaware, are all well adapted for this purpose and in the order named, for the latitude of New-York, where the Delaware is easily kept until February, and the others until April. Farther north the Delawares may be kept until spring. Grapes for keeping must be taken before the stalks lose their vitality and begin to dry.

The Quality of Vines as affected by Age and different Modes of Propagation, and the Economy of the different Kinds to the Purchasers.

Vines are chiefly produced for commercial purposes by six different methods, and although the value of the plant varies greatly, according to the plan of production, it differs still more in accordance with the different degrees of attention and skill under which nearly all of the plans are executed.

Each bud contains a perfect young plant, and the business of propagation is not to create a new plant, but simply to afford it an opportunity for development by affording to it safety from injury, and the proper nourishment during its infant progress. The propagating house is the nursery for infant vines, to bring them forward in health to vigor and hardiness.

The greatest degree of attention is required by single-eyes or short-cuttings, because, when detached from the mother-vine, but very little sustenance goes with them in the form of sugar that has been laid up in the small piece of wood that belongs to them. The plants must go through a long, critical period, in which they are liable to receive injury that will permanently affect their health and prosperity.

Vines that are started in March will, at the end of the season, present a very great difference in appearance, according to the conditions under which they have been produced, and may be either valuable or less than worthless.

It may be stated that the vines designated as Extra and Best Selection, have all of the advantages of vines that rate as No. 1, at two years old, that have been transplanted and root-pruned, and something more. The Extras and the best selection have the real excellence of the vine more fully and perfectly developed than the No. 1, and will continue to give better results perpetually.

Those who get the best vines do much more than gain time—they gain perpetual excellence in quality and quantity.

How Vines of Best Selection, etc., are produced.—Wood for their production is taken from the most perfectly developed vines, that is, such as have the most perfect balance of all their parts, rejecting alike the produce of those that are gross and of those that are feeble. The eyes thus obtained are about the first of February placed in the most favorable circumstances for growth, and thus continued until the weather becomes mild enough to put them out into the open air. At this time they may have undergone six changes from small pots to larger, until they have acquired the size of root and foliage that belongs to No. 1 vines of my Catalogue.

They are now in full health and vigor, with all of the favorable part of the season before them in which to acquire a *second season's* hardihood and vigor, and if they are so managed as to avoid all check and damage to their leaves, they do acquire it with the additional advantages, which there is not room here to state, but which have been shown by actual trial during the past five years, to be so great that persons from all parts of the country, who have made the experiment by growing them in gardens and vineyards, constantly affirm that they are cheaper at the prices paid for them than vines of a lower grade at no price. All of the vines thus treated are very good, but not equal. Three grades are made of them, the best constituting the Best Selection, the next Extras, and the third best, No. 1. Those for No. 1 are started in March and those for lower numbers later. The whole art, in its best management, is one that requires more knowledge, skill, and care than any other belonging to cultivation. When I begun to offer vines to the

public, it was necessary that something as to the quality of the plants should be taken, with no better proof of my statements as to their value than could be shown in my own grounds. Now I have not only the testimony of all of the best cultivators in my favor, but also that of hundreds of thousands of vines, all testifying to the same truth.

There are two kinds of No. 1, first those intended for Extras, and come short of it, and those grown specially for that designation.

It should be borne in mind that the numbers of one person's catalogue have reference to his own vines, and not the least regard to those of any other. Purchasers will seek in vain to find elsewhere vines that have been produced with the care, attention, and cost of my No. 1, and my No. 3 challenge comparison with the best No. 1 of any other catalogue.

The actual cost of vines of best selection has been well stated by Mr. Mead at not less than one dollar each. I may also say that they have not been produced by any person except myself at any price. I do not say that as large vines have not been produced; for by growing them in manure or beds of muck, very large size may be very cheaply obtained, but only one or two years of trial is necessary to show that such vines or trees are of little or no value. It has been tried with apples, pears, and other trees, and after a short apparent success, abandoned as a disastrous failure. The full discussion of this subject would require a volume, but the well-ascertained facts that are chiefly of interest to purchasers may be stated in a few words. All propagation of vines from wood is artificial, and that method which produces the best plants, as shown by their hardiness and the excellence and quantity of

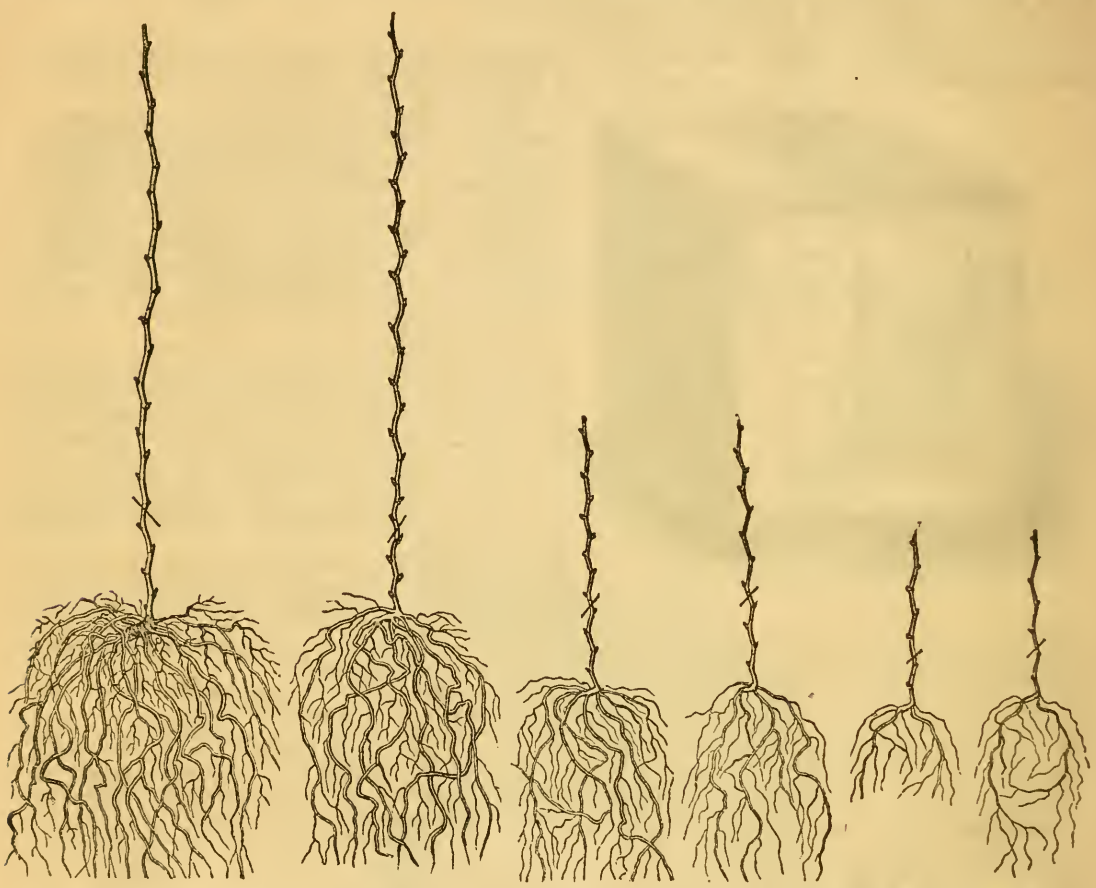


Plate No. 9. Plate No. 8. Plate No. 7. Plate No. 6. Plate No. 10. Plate No. 5.

produce, is the best. Propagating houses are not used because they produce plants more cheaply, for they do not, but because they make better plants than can be made except by layering, when it is properly performed. Mr. Barry truly stated that one plant from a single eye, well produced by the aid of a house, is worth more than six grown wholly in the open ground without such aid.

I would not state that because plants are grown in houses they must be good, for the most worthless plants in countless thousands have been thus produced, and will continue to be while cheapness is accepted irrespective of quality.

This matter has been fully discussed by Mr. Mead in an excellent lecture on the subject, which he has prepared in answer to the wants of this particular time, when it is of great importance that the conditions of success in vine-planting should be known.

The conditions of success are well known and easily furnished, and the cultivation of the vine, when well managed, offers a more speedy and abundant reward than any other fruit, and is less complicated in its management, but its requirements are imperative.

Although the interest that attaches to the grape in vineyards has become very great, and is very rapidly increasing, it is very small in comparison with that which belongs to the vine in the yard and garden for the full supply of the family; not for furnishing grapes by tens of pounds for a few days, but by hundreds of pounds for half of the year.

Good Delaware grapes may now, in their season, be bought in market, but only at very large prices—as forty cents a pound and upwards; but the difference in the benefit and enjoyment afforded by those grown for market and those obtained from the owner's well-managed vines is so great, that it can not be fully credited except from trial. Many have learned this, and are now planting vines by the hundred for family supply. Those who have a surplus of best quality are obtaining much higher prices for them than that just named.

In Plates Nos. 5 to 9 may be seen five different grades of plants. A Delaware or Diana vine like that represented at No. 9, will, when four years old, if indulged in its productive disposition, produce from eight to sixteen pounds of excellent grapes. At the same time No. 5 might be expected to produce one pound of very poor ones; but to do that it will have required, during its two first seasons, a much greater nicety of attention in guarding and preserving it from drouth and injury. If we go on to the age of ten years, the disparity in produce will not be nearly as great as at four years, but it will not be less than twenty-five per cent in quantity, with probably an equal difference in the quality, as exhibited in size, beauty, and flavor. In pursuing the matter to the end of the tenth year, we shall find, that while one vine has produced upward of one hundred pounds, the other has produced but little more than fifty. The present wholesale price of Delaware grapes, of fine quality, is from thirty to thirty-five cents per pound, showing a difference in favor of the large vines, all expenditure included, except cost of vines, of from twelve to eighteen dollars. This estimate is intended to apply to the size of vines as limited to the Thomery plan—that is, with arms four feet each. If carried out into a larger plan, with arms six or ten feet each, the disparity will be much greater in favor of such a vine as shown at No. 9. The plan for a single vine is shown by Plate No. 18, where the vine is three years old, to be extended at *c*, *c*, and in a vine four years old by Plate No. 17.

There is another consideration that is important to be remembered •

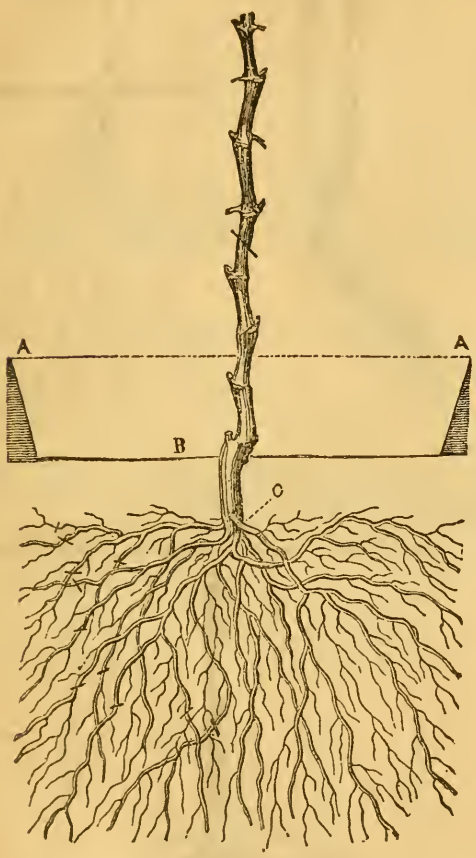


Plate No. 11.

Plate No. 12.

the degree and kind of attention under which the one shown at No. 9 will thrive during the two first seasons, may not be sufficient to keep such as shown at No. 5 from dying when planted in vineyard or garden.

The reader will have no difficulty in applying the same rule to the intermediate grades. Another calculation is required for estimating the value of vines for the vineyard, based upon the same principles, and leading to similar results. It will be given in another publication called VINEYARD CATALOGUE; and the subject will be found still more thoroughly treated in LANDMARKS, and also in the MANUAL OF THE VINE.

The difference in the vineyard is equally great in favor of the best vines from single eyes, but does not appear so striking when we take only a single vine, because the amount is small, the vines being made to occupy but a small space; and the produce must be nearly in proportion to the space occupied. At three years old Delaware vines of the class "extra," like that represented in Plate No. 9, in the vineyard, will bear and fully mature four pounds each, and leave the vine in perfect health, with increased ability for next season's crop. The fruit will be of such quality and beauty as will bring the best price and build the reputation of the producer. A vine rating as No. 4, if well produced, may, at the same time, begin to bear, but not sufficiently to yield any thing of value.

The grapes from the former, if used for wine, will be worth fifteen cents per pound, making sixty cents for each vine. At four years old, the vine will be able to bear more, but extreme prudence for the health and longevity of the vineyard may restrict the crop to that amount. The sum earned by these two years will be one dollar and twenty cents. The crop at two years old, which has not been named, may be reckoned sufficient to pay for the cost of cultivation up to the time of gathering the crop of the fourth year. At four years old, one of the class, No. 3 or 4, such as represented in Plate No. 9, may be expected to yield a profitable crop half equaling in value that of the extra at three years, or approaching in value that of the extra at two years. But to do this, much more careful attention, both in the preparation and planting, and also in tillage, will be required then by the "extra." At five years the

vine of lower grade will nearly equal the amount of the former at three, but not nearly in the beauty of the fruit. At this time the first will have advanced to six pounds as the full weight of crop that it may be suffered to carry perpetually, fully maintaining the health of the vine and the quality of the fruit. The "extra" will perpetually maintain a superiority, in both quantity and quality, of at least one fifth over the other, which, commercially, will be found to be much greater.

At five years old there will be, at least, fifty cents net in favor of the

Plate No. 13.

Plate No. 23.

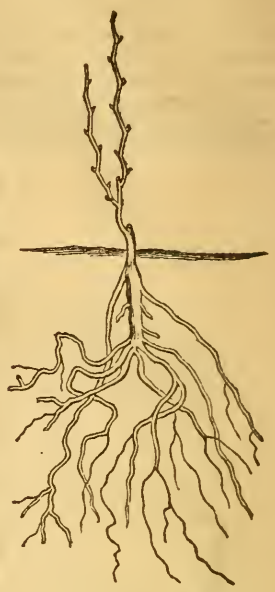


Plate No. 16.

best vines at prices for wine, but for the table the prices of the grapes and of the amount in favor of the "extra" vines will be doubled. The number of vines to the acre will exceed two thousand; but that number is convenient to use, and is sufficiently near the truth for our present purpose.

An advantage of fifty cents per vine is equal to the large sum of one thousand dollars an acre. Although this appears startlingly large, it is safely within the bounds of experience.

Size is only one of the conditions of quality among many which I can not here specify, all of which are important to the full measure of

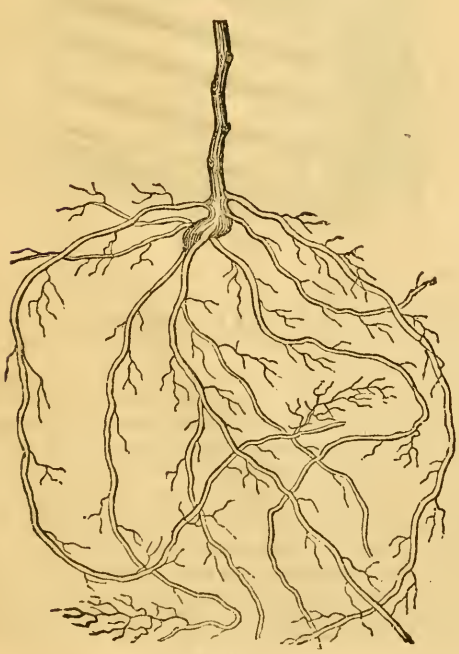


Plate No. 14.

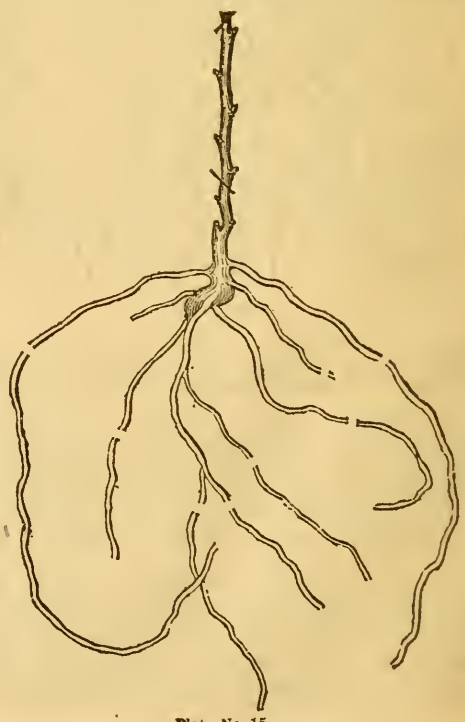


Plate No. 15.

success. Only one more will now be named, which is the importance of the full ripening of the wood and roots, which only takes place where the leaves, after having fully performed their office, take the hues of autumn, and fall off entire in their ripeness, without shriveling and rolling up from mildew, blight, or frost. One of the very important conditions which have always given surpassing excellence to my vines, as shown by their performance in every part of the country, has been owing to the exemption of the locality in which they are grown from late and early frosts, which has permitted the perfect ripening just named, in consequence of which the vines have acquired a degree of hardiness elsewhere unknown. They have received the same general commendation from almost every quarter of the globe in which vines are grown, requiring only the simple treatment prescribed in Illustrated Catalogue, and also in Gardener's Manual, for constant unfailing success.

It is a great error for purchasers to buy inferior vines, thinking to bring them up to good condition by their own superior management. The fact should always be borne in mind that vines can be much more *cheaply* brought to good condition by the propagator than by the vineyardist or gardener, leaving out the consideration of loss of time.

Plate No. 11 represents a transplanted vine of best quality, which will produce the results ascribed to that represented by Plate No. 9. Plate No. 12 represents a vine grown in a box or crate, having a lattice bottom and sides, by which a sufficient quantity of roots at the center

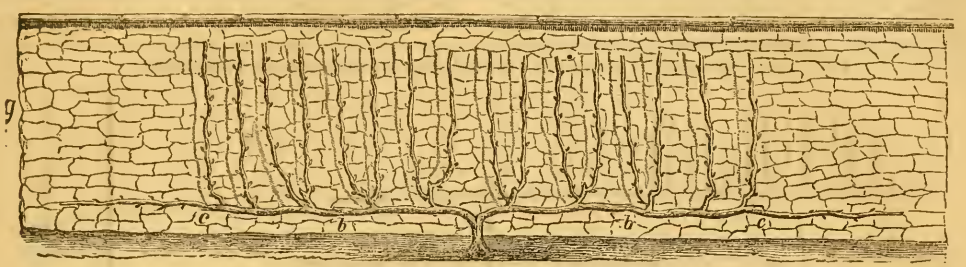


Plate No. 17.

remain undisturbed by both transplanting and transportation; and consequently the vines, if well grown, are able to produce a crop the first season. The capacity of the boxes is greater than that of the largest pots in which vines are grown for fruiting, and they are filled with soil, specially prepared to induce the formation of fibrous, fruit-bearing roots, which is also further favored by the position given to the layer. These plants are not only better in consequence of these attentions, which can not be given to other layers, besides the advantage of not being checked by transplanting. These will be more than two years in advance of an extra single-eye plant like Plate No. 9. By additional care and expense, vines from single-eyes, more advanced toward productiveness than the one shown at No. 9, may be grown in pots, as represented by Plate No. 13; but when taken from the pots, and the soil shaken from them, one year of time is lost by transplanting. By sending them in the pots this is saved, and the bearing is hastened. As these require special management to secure their full advantages, directions for the purpose will accompany the plants.

An impression prevails extensively, that by the increase of age simply, the time of productiveness is advanced, and that an ordinary vine of three or four years old is as much nearer to establishment in bearing than a vine of one year, as it has more years of age. This is a mistake, by which many are disappointed. A vine of four or five years old, as ordinarily grown, will generally give some very imperfect bunches the season of planting, but it will be longer in giving a full crop than one of the best quality that is only one year old; and it may be generally stated that vines so old before transplanting, never attain a good bearing condition. Old vines, before planting, must be so severely cut back by the operation of root-pruning, that they are brought into the condition of one-year-old vines as to length of roots, but with some important advantages lost for the formation of fibrous roots at the center, which can not be regained by any course of treatment.

Plate No. 14 represents a Delaware vine, one year old, of best selection, grown in open ground. It is not as well furnished with fibrous

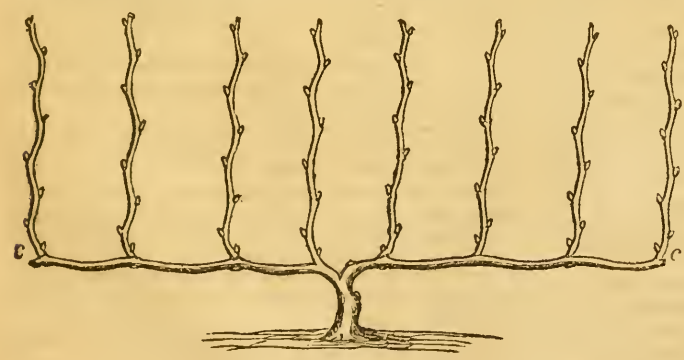


Plate No. 18.

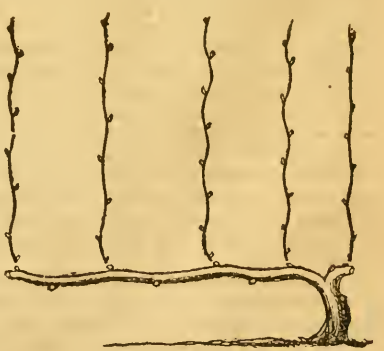


Plate No. 22.

roots as if grown in a pot, but is larger, and if properly treated by root-pruning and planting, will bear very early and abundantly. If suffered to remain until two or three years old before transplanting and root-pruning, it will present the appearance shown in Plate No. 15, the fiber having nearly or quite left the parts where it should be, and gone to the extremities of the roots, where it will be all cut off at root-pruning, and will only be replaced at the ends where the cuts are made, and not along the sides of the roots. It is not difficult to make shoots spring out of the old branches of vigorous vines, but very difficult, if not impossible, to make new roots spring from the sides of old ones. The vine at one year old was worth more for planting than it could be ever after, except by being subjected to the operation of transplanting and root-pruning, by which it would be brought into the condition of the one represented in Plate No. 11.

Grafted vines need peculiar treatment, without which they generally disappoint expectations. The union of scion and stock is generally very imperfect, and the vines thus produced are greatly disposed to reject the stock, and form their own roots. This should be favored by

setting the stock so low that opportunity will be afforded for roots to form at the proper depth from the new vine.

The best course of proceeding is to set the vines at least one foot further from the place which the stock is to occupy than would be done if vines on their own roots were used, and then, by laying one year more, good vines on their own roots will be obtained.

The stocks have also a strong disposition to throw off the new vine, and are constantly throwing up shoots of their own, which must be suppressed soon after their appearance, or they will take all of the action, and leave the new vine to die. This not unfrequently occurs; and those who do not understand the case, by leaving the new shoots, which are the strongest, have found their vines, at the time for fruiting, all of the kind used for stocks. This has occurred in numerous instances. Those who are watchful have no difficulty in detecting the shoots of other vines, in case of the Delaware; but when the similarity is great, as between Union Village and Isabella, it is difficult for any one to see which should be suppressed, without examination under the surface, which is very difficult.

Very strong vines at one year old are easily made by grafting; but besides the objection named, is that of imperfect growth, unless treated as just mentioned; the union being so imperfect that the roots of the stocks are not induced to form the small, active fibers. The largest specimens are often produced by young, grafted vines, the imperfect union having the same effect as the annular incision. Plate No. 16 represents a grafted vine, as they ordinarily appear, at three years old, when dependent entirely on the roots of the stocks. They are destitute of fibers, and not in vigorous health. In Plates 11, 13, 14, 15, and 16, are seen marks to direct in root-pruning preparatory to planting.

The foregoing statements are the result of very extensive experience and observation during the past fourteen years, and my desire has been to make them trustworthy and useful, so that purchasers may know what to obtain to avoid disappointment.

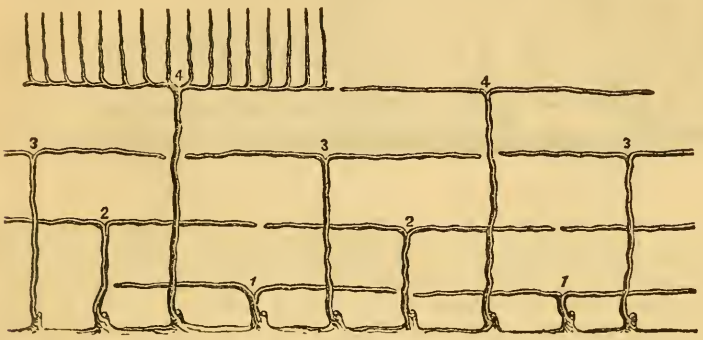


Plate No. 20.

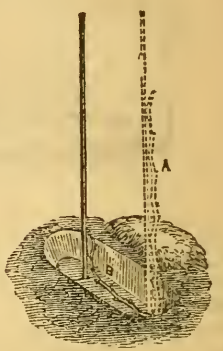


Plate No. 19.

THE VALUE OF PLANTS ACCORDING TO THE METHOD OF PRODUCTION.

Vine plants differ in character and also in value, according to the plan of propagation; but they vary so much more according to the conditions of treatment, under the different plans, that no statement that will precisely and universally define their quality, according to plan of propagation, can be made.

The best possible plant that can be made is the best possible layer of one year old, grown under the best possible conditions, for removal from the place in which it is grown, to be set in place for fruiting. Plants grown in crates, or baskets, by which the vines are removed and reset, (transplanted, transported, and replanted,) without disturbing their connection with the soil, so as to check their productive ability, fulfill all of the important conditions. The best possible plant, in the most favorable condition, is the Box Layer, which undergoes no more disturbance in removal than the root-pruning which it requires.

This statement must be made with a possible reservation, for a plant from single-eyes of best selection, by repeated transplanting, root-pruning, and growing in large crates, or baskets, for a series of seasons, may be made to equal the best plant of one year before named. This would be so troublesome and expensive that it would scarcely be done.

We may then say, *with general truth*, the best layer, under ordinary circumstances, is the best of plants, and the best uncovered layer the best of uncovered plants. But it is possible, by the best degree of skill, to make a root-pruned transplant equal to a naked layer, although only by a painstaking and expensive process, that has never been resorted to for the production of plants for sale.

It will give an impression, generally true, to say, that the next best grade of plants includes two kinds, each, under the most favorable conditions, by a slight advantage, for special uses, but both excellent for all general uses. These are root-pruned transplants from the best single-eye plants, and the best single-eye plants. A plant from two eyes can be made just as good as a plant from one eye, although the case rarely occurs; but a plant from two eyes, in open ground, unaided by a house and bottom heat, can not be made nearly equal in value to a plant from a single-eye, aided by a house and its proper appliances, under the most favorable conditions.

Green cuttings, under ordinary circumstances of production, are inferior plants, but I can, and often do, make plants from green wood of such excellence that I do not like to part with them, preferring to retain them, in consequence of their superiority, for my own use. I have not room here to state the particulars in regard to green cuttings, but must ask readers to take my statements made after extensive trials during eight years, or read the full exposition in LANDMARKS.

The process of making the best plants from green cuttings is too expensive to be generally adopted, but inferior plants, by this method, are very cheaply produced.

Grafts may be made to be very good for the proper course of treatment, but for ordinary treatment, and under ordinary conditions, they are much less valuable than single eyes.

The best long cuttings can not be made to equal the best of any of the kinds that have been named by any ordinary process, and the plan may, therefore, be said to be inferior.

The manner of executing this plan is generally so defective that the plants produced by it are unfit for any purpose. They are produced and sold in great numbers for less than one fourth the price that plants by this plan would actually cost, which would be called good of this class by those who understand the matter. These are generally bought by cultivators of the least knowledge, who think all abatement of price so much saved.

Plants, under the foregoing view of the case, may be said to rank in value, according to the method of propagation, as follows:

First. Box Layers, or Layers in the soil.

Second. Naked Layers, or Layers taken from the soil.

Third. { Transplants, root-pruned, two years' old.
{ Single-eye plants, or short cuttings, rooted by bottom heat.

Fourth. Best green wood plants.

Fifth. Grafted plants.

Sixth. Plants from long cuttings, well treated.

These grades refer only to plants honestly and skillfully produced There are imitations, whose rank in value is too low to be stated. Very many "improved plans, by which vines can be produced at the follow-

ing cheap rates," have been practiced upon, all of which have failed to produce plants from which buyers have obtained or can obtain good results in the garden or vineyard. Cheapness may be acquired in various ways, and the buyer should learn that he is always expected to pay largely for the use of the "*improvement.*"

Apparent size may be very cheaply given by the distention produced by liquid manure. Half the cost may be saved by infrequent changes of pots; that is, by putting the plants at once into the largest size in which they are to grow, instead of going through the regular gradations. More may be saved by transferring the plants as soon as rooted to the open ground. In both of these cases the plant will be without the fine fibre that constitutes their chief value.

Another half may be saved by omitting the use of stakes, and so avoiding the cost of stakes, of tying and removing of laterals.

More than another half of the remaining cost may be saved by growing four plants in the space that should be occupied by one.

A plant called No. 1 may be grown, and often is, for twenty cents, that will afford the producer much better rates of profit than a first-rate real No. 1 will afford at fifty cents, while the latter will be found in the result cheaper by much more than the cost of purchase.

Although vines, by other processes, may be made as good and as well prepared for immediate bearing as box layers, which has just been shown, they never are so made, and the circumstances of the case do not permit that they should be to any considerable extent.

In all cases, to make them as good, they must be brought forward to the bearing state under the most favorable circumstances, and the conditions of their first future prosperity must be transported to purchasers with them, in the form of the undisturbed soil in which they grew, as in the case of the box layers.

Those layers are grown for different plans of training, some of them having but one strong bearing cane, and others two of equal strength. By using such vines a trellis for the Thomery, or other good systems, may be handsomely covered with strong canes the first season, and some fruit, with a large crop, the second. At two years old the arms will be formed as shown in Plate No. 20, Figures 1, 2, 3; and at three years old the bearing courses will be fully established, as seen at Figure 4; the vines bearing uninterruptedly during the course of preparation. The cost of maintaining the large vines during the three years will be no more than for small ones, and the value of the fruit that will be borne before good vines from single eyes will be in full bearing, will more than pay the entire cost of the box layers. They are not only the most desirable because they immediately clothe the trellis with beauty and furnish some excellent fruit, but they are the most advantageous commercially for the worth of their early produce, although the cost appears to be dear. To propagators they are dear, costing both the fruit and life of the mother vine that is of full bearing age. The canes of both the box layers and the nude layers of best selection are strong enough to prune for the standards of a Thomery trellis, including the bedding, so that arms may be grown the first season.

The best vines of all the different classes are so generally the cheapest, that it may be stated as a general rule. Purchasers never speak with regret for having taken the best vines, but hundreds have regretted not having taken them, even by the thousand, for vineyards as well as for gardens. Very many have also had cause to regret not having followed the directions for planting and management, as they have informed me, but not one has yet complained of being misled by them.

It is now six years since the first edition of my Catalogue or Manual of Instruction was published, and many thousands have been guided by it in the purchase of vines, and in their treatment, and it is very satisfactory to be called upon to make large additions for those who desire to study the subject more thoroughly, while I have not found cause for retraction either in the directions or in the description of the varieties for which I brought the knowledge from my own investigations, and from the vines cultivated and managed under my own observation, and chiefly with my own hands. They were not only "my early observation and my last," but my all-day companions. The companionship of the vines has been, for nearly half a century, very pleasant to me, with constantly increasing interest, and it should not be regarded as surprising or unexpected that I have never been mistaken in the character of any of them, although my descriptions of their qualities and capabilities have been made with a degree of precision and minuteness that has never before been attempted.

The extent to which the observations in the Iona Catalogues have been copied, affords some evidence that they have been suited to the wants of the times, and some flattery should be taken; but wanting the extreme of benevolence and good nature, I feel disposed to complain of the almost universal neglect to give credit, which should at least be done where copy-right is taken.

Some desperate attempts have been made by changing a word or sentence to avoid liability to an unpleasant charge, and when a man mis-copies, in praising a grape, it is "perfectly cloying," instead of "perfectly satisfying," the greater sin should obscure the less, and the stealing of a chapter should be suffered to pass unreproved.

The additions which I have been able to make through the kindness of Mr. Mead, are very important, and give with very great clearness and lucidity the main conditions upon which success both in garden and vineyard depends. Mr. Mead has prepared himself for the position that he now occupies, by many years of attentive study as well as of the most extended observation throughout the entire extent of the country. The selections made by him have been done under the full knowledge of all that pertains to the whole list of native kinds, and are worthy of attentive consideration. The Lecture is very valuable.

Selection of Varieties to plant for table or family use, and some of the considerations which determine the proper choice.

A TABLE grape, to be valuable for constant use, or rather to be desirable for constant use by its goodness, and to grow upon the desires, for the refreshment it affords, never sating the appetite or becoming oppressive and distasteful, must be vinous, refreshing, and rich, pure and spicy, having nothing in its skin or flesh to offend or disgust, on the most intimate acquaintance.

The bases, or, more truly, the conjoined base of the wine and refreshment are tartaric acid and sugar. The aromatics, which are recognized by both the gustatory and the olfactory senses, are subordinate to the vinous property, but when pronounced and of the best quality, they greatly increase both the restorative power and inspiriting effect, as well as the sensuous delight.

The properties named are all distinctly recognizable by attentive observers, with the exception of the few whose perceptions are very blunt and defective. But in addition to these pronounced qualities, there are in the richest and best of grapes other exquisite harmonious minglings, which neither the chemistry of the senses or of the laboratory has yet been able distinctly to exhibit and point out, for which we have no name but the superlative of excellence and delight that is comprised in the name of the fruit. Thus with the Northern Spy Apple, the Muscat of Alexandria, the Red Frontignan, and the Delaware grapes, we point out their more prominent and distinctive excellencies, but are compelled to leave them half analyzed, and give their name, as alone sufficient to suggest their whole character, which will scarcely be intelligible except to those who know them.

This harmonious excellence admits of no discordant offensiveness, without destruction of the symmetry of character, upon which the charming goodness depends.

We may say, with scarcely a grain of allowance, that we have such peaches and pears, and strictly that we have such apples and grapes, but the eminence in purity, as well as in power of invigoration, belongs to the grape, constituting it the most excellent of fruits by its delight and benefits.

In making the selections, there is a restriction to particular latitudes for some of the very good kinds, in consequence of their want of earliness in ripening, but the Delaware, which is the best of all, is, also, the most hardy and productive in every region and locality in which grapes of any value can be cultivated. Consequently, it will stand at the head of every list of table grapes.

The Diana, in consequence of its excellence in quality, when perfect, with its earliness, hardiness, and great productiveness, is generally placed next to the Delaware. In size of bunch and berry, and in very late keeping, it exceeds the Delaware, but in earliness of ripening, and in precocity of bearing perfect flavored fruit, it is below it. The first produce of young vines of every kind is always imperfect in

flavor, and generally deficient in size. This rule obtains in the case of the Delaware, but much more markedly in the Diana, and particularly in regard to the fruit. Large layers often bear profusely the season of planting; but unless the season is very long, the skins remain very thick, and the fruit without richness or purity of flavor; each year of advance in age making a great improvement, until the vines are four or five years old, when the great excellence that belongs to it becomes apparent.

Under some considerations, Allen's Hybrid may claim the rank of second to the Delaware. Its fruit is large, beautiful, and of very high excellence in quality, being tender as the Golden Chasselas, and equal to it in transparent beauty, but much more spirited and invigorating. It bears sufficiently early, and appears to be more hardy than Isabella and Catawba—perhaps equaling Diana—but that can only be learned with certainty by longer trial. Its fruit keeps very well, but not so long as Diana, nor is it quite equal to it in vinous refreshment; but its excellence is so great that there is no danger that it will be overpraised. It is very early, and may possibly equal the Delaware in that respect when the vines become mature. The rank of this is easily third, if not second for the table; but for wine, Diana is clearly above it; although no doubt can be entertained that the Allen is able to make good wine.

Lincoln, for its proper latitude, will come next; but in regard to its latitude, there is much doubt. It originated in the mountains of North-Carolina, where the winters are severe, and it withstands all of the severity of the changes of Cincinnati, in which the mercury often falls as low as in New-York, and it has not suffered at Iona, nearly a degree north of New-York; but the trial has not been long enough to fully determine that point, for which several years will yet be required.

It ripens very early when the vines are mature; its bunches are large, but its berries scarcely medium; but its pure rich wine challenges criticism, and its flesh is equally good to the center. It is high praise for a table grape to say, that in addition to the other requisite qualities, it makes excellent wine, for that is proof of its refreshing quality, in which the Lincoln is equally distinguished as for its sugar, but less spicy than Elsinburgh. In placing it fourth, the Elsinburgh and Lenoir must be placed by its side, and also the Herbemont, for quality; the Herbemont being less sugary than the others. The Alvey may also come into the same group, with flavor resembling Herbemont, but ripening much earlier. Of Pauline it is too early to affirm as to the period of ripening, but it does not appear to be quite so late as Herbemont, and in hardiness perhaps it is equal. One degree north of New-York, a Herbemont vine, on the south side of a house, has continued to ripen, and withstand the winter fifteen years; whereas it would not do either perfectly, in all cases, in the open ground, in the latitude of New-York. The Pauline is one of the richest and most spicy of the perfectly pure, tender-fleshed grapes, and is not below the exquisite Shiras in that respect. It is one of the most hopeful subjects at present, for trial in the gardens of amateurs, but has not obtained rank yet, except for quality, which is first, or by the side of Delaware.

To a few it is impossible, in this summary, to give any numerical position of rank, but it will not be difficult to fix the estimate at which each person will choose to hold them for his own particular circumstances, by recurring to the description of varieties, where they are all carefully characterized.

Anna is the highest flavored and most spirited of grapes, but while pure in flavor, is not without its two defects, which are, that it sometimes loses part of its berries by the rot, and, like Isabella and Catawba, it does not till late in the season lose all of the toughness in its center. To sick persons it is often of special value. A few vines of it are enough for any collection, and no collection is complete without one. Few would be without one Union Village, for its earliness and great size. Rebecca is good and pleasant, and often a favorite, but never high-flavored.

Coleman's White appears to be identical with Cuyahoga, although Cuyahoga at Cleveland is very different from the former at Cincinnati; but parties who have been conversant with both from the beginning, affirm that they are the same.

Of Creveling, Concord, Hartford Prolific, it is not necessary here to speak.

Our two most hardy, constant, and prolific kinds that ripen unfailingly through an extended latitude, and that have been thoroughly proved, are Delaware and Iona. If we take a narrow belt of six degrees, having New-York for its center, we shall include the region most favorable and advantageous for the grape. In sheltered situations, and on the south side of walls and buildings, these two may be grown and ripened more than two degrees further North, and very much further South, only in going South the season of keeping becomes shortened with kinds that ripen early, so that in the latitude of Augusta or Atlanta, Georgia, these kind can not be had for use more than two months, while toward the Northern limit of perfect ripening they may be had six or seven months, but not with the full degree of flowing richness that belongs to them when ripened at the South. The Israella will probably have a more extended range than these, but that has not yet been proved, except by its very early ripening.

For the belt of six degrees the Iona is equal in value to the Delaware for a table grape, but with its own peculiar advantages, for which see descriptions, and also Mr. Mead's letters, one of which is appended to the Selections, and two others are in the pages of the Catalogues, all of which are worthy of attention for the illustration of important facts that are interesting to every lover of good grapes.

Although the Iona is now, for the first time, offered for sale, it is not untested, but has been thoroughly proved as far North as Northern Vermont. It ripens fully farther North than the Concord, which it equals in size and surpasses in uniform constancy of production, having never been affected by rot, which in unfavorable seasons has been destructive to the crop of the Concord. The comparison can not be continued, for in beauty and quality they are not to be named together, the latter having the leaden opacity that is always a characteristic attendent of all the offensive qualities of the Northern fox grape, while the Iona has all of the bright, clear translucency of the Frontignans, the best and most spirited of the Foreign kinds, and which it the most strongly resembles.

The following table is made for a belt extending two degrees north of New-York, and indefinitely south. A slight variation only will be needed for adapting it to all of the conditions of this extensive range, the chief of which will be the omission of the Herbemont in some localities north of New-York, and adding Pauline in some localities south. The selections are for six, ten, twelve, fifteen, twenty, and thirty vines. When a greater number is desired, it may be found by doubling the selection of twenty or thirty. I have not had in mind an interesting collection of good grapes, but the most valuable selection for use. Many persons would desire one each of all of the kinds described in the catalogue to complete a collection.

	6	10	10	12	12	15	15	20	20	30	80
Iona,	2....1	3....2		3....2		3....4		5....6		8....7	
Delaware,	2... 2	3....2		3 ...2		3....4		5....6		8....7	
Allen,	1....1	1....1		1....1		1....1		1....2		2....3	
Israella,	1....1	1....1		1....1		1....1		1....1		2....2	
Diana,	1	1....1		1....1		1....2		1....2		2....3	
Lincoln,	....	1....1		1....1		1....1		1....1		1....1	
Elsinburgh,	....	1		1....1		1....1		1....1		1....1	
Anna,	....	1		1....1		1....1		1....1		1....1	
Union Village,	....	....		....		1....		1....		1....1	
Alvey,	....	....		1		1....		1....		1....1	
Herbemont,	....	....		1		1....		1 ...		1....1	
Rebecca,	....	....		....		1....		1....		1....1	
Lenoir,	....	...		....		....		1....		1....1	

The foregoing table gives two selections for each number very nearly as I should plant for myself. If so small a number as twelve is to be planted, so as to afford the greatest advantage from the best fruit, not more than four kinds would be taken. But there is an interest attaching to variety that will call for at least eight.

In the above selections, sufficient importance is not given to Anna and Israella.

	6	6	10	10	12	12	15	15	20	20	30	80
Delaware,	3....3		4....4		4....4		5....5		6 .. 8		12...12	
Iona,	1....1		1....2		2....2		2... 2		3....3		4....4	
Allen,	1....		1....2		2....2		2....2		2....3		4....4	
Israella,	1....		1....2		2....1		2....1		2....1		2....1	
Diana,	....		....		....		1....1		1....1		1... 2	
Creveling,	1		1 ...		1....1		1....1		1....2		2....8	
Concord,	....		1....		1....1		1....1		2....1		2....2	
H. Prolific,	....		1....		1		1....1		1....1		1... 1	
Lincoln,	....		....		....		1		1....		1. ..1	
Elsinburgh,	....		....		...		....		1....		1....	

The second table is for latitude more than one degree north of Albany and Boston. For this latitude I think Iona will be equal to Delaware, but it is not yet clearly proved, and I have made the number much less for the present, waiting full proof with older vines.

Iona, September 30th.

Mr. Peter B. Mead:

Dear Sir: I want to enrich my Descriptive Catalogue with a selection, made by yourself, of one hundred vines, for affording a family the largest amount of enjoyment that can be furnished by grapes; having in mind, also, an interesting collection, such in brief as you would plant for yourself.

The considerations which influence the selection will be valuable and interesting to every one. Your truly,

C. W. Grant.

New-York, October 1st, 1863.

Dear Doctor: In answer to yours, requesting me to give a list of one hundred vines, such as I would plant for the table, I send you the following:

Delaware,	25	Elsinburgh,	2
Iona,	25	Lenoir,	2
Diana,	10	Rebecca,	2
Allen's Hybrid,	10	Alvey,	2
Israella,	10	Union Village,	2
Anna,	3	Herbemont,	1
Creveling,	3	Concord,	1
Lincoln,	2		

The Delaware and Iona I should plant most of, not only because they are of excellent quality, but because their habits are reliable. Their hardiness, productiveness, and excellence constitute them our best grapes, or, at least, my favorites. The Diana ranks but little below the Delaware; but it requires a longer season, and the vine needs age and good treatment to work off the toughness of its skin. The Allen, in my opinion, is a grape of very fine quality, and one that will satisfy a nice taste; but in some places it has suffered from mildew. In a favorable locality, and with good treatment, it will sustain a high character. The Israella I should want a good proportion of, because of its earliness, productiveness, sweetness, and good flavor. The delicate tenderness of the flesh, melting quite to the center, is a very important characteristic of both the Israella and Iona. The Creveling I put in the place of the Hartford Prolific. It is a much better grape, with a more lively juice, and at most only a few days later. The Anna I should be sorry to be without. It requires a long season to become perfect, but in flavor, when ripe, it is almost equal to a Muscat of Alexandria. I should be willing to take a little extra pains with it for the sake of its fruit. I forgot the Anna when I said the Iona was the only native grape that had a muscat flavor. The Lincoln, the Elsinburgh, the Lenoir, and the Herbemont are all small berries, but there is so much wine in them, and they are so refreshing, that I should hardly consent to be without a few of them. I put in the Union Village and Concord for their size, and for purposes of comparison, as well as to please such friends as like a "big thing" on a plate, and not because they are quite to my taste. The Union Village has not the offensive foxy odor, which characterizes the Concord. I would put in the Catawba, for its spirited flavor, but it rots incorrigibly without more trouble than I feel disposed to give it. I am very busy, and have given you briefly my reasons for selecting the above list, as I supposed you would like to know them.

Selections for Vineyards, Latitude of New-York.

For Wine Making.

For this purpose the number will be limited to two or three, including only Delaware, Diana, and, perhaps, Iona. The proportion will be at least two of Delaware for one of Diana.

Vineyards for table use will also be limited to a few of the best kinds which greatly surpass all of the others in value.

Delaware and Iona will lead and become the principal grapes for commerce. Diana, for this purpose, is also very valuable for late keeping, and distinct in its own peculiar excellence. Israella, when the vines become sufficiently numerous, will be particularly valuable for its earliness, and Creveling may also be admitted.

It will not be many years before hardy grapes will be for sale eight months out of the twelve, and the taste is already sufficiently educated or developed to show that only the rich spirited kinds will be in demand. Sincerely yours, Peter B. Mead.

Is C. W. Grant influenced by interest in the recommendation of kinds?

The question very often arises: "Is not C. W. Grant influenced by pecuniary motives in his recommendations of vines for cultivation?" "Is it not for his pecuniary interest to propagate and sell the Delaware, and to discourage the sale of such kinds as Hartford Prolific, and Concord?"

A brief statement of facts will show the direct contrary, and that on learning their character I at once gave up the advantage of having at an early period a large stock for propagation and sale, which had been acquired at great expense under an erroneous representation of their character and quality. In 1857 I had the best stock of both these kinds in the country, and had learned their extreme facility of propagation, but I had also learned their poverty of quality and the excellence of the Delaware and Diana, both of which had in my hands made very great improvement in their habits of growth and in the quality of their fruit; and the vines of my propagation which had been put into other hands in different parts of the country, numbering in all some two hundred and fifty plants, showed clearly that the improvement was permanent and progressive. In the language of Col. Wilder: "They had at Iona Island, in the hands of Dr. C. W. Grant, received just what was required in the way of cultivation for the development of their true character, which is so different from that which they had before exhibited, that they were scarcely recognizable as the same fruit." Of the excellence of the Delaware in every respect, in its improved condition, I had numerous testimonials from every quarter before making a general offer of plants to the public, and had made a pretty extended "proving" of the Diana also. Before it came into my hands it was generally declared to be a weak grower, as was also the case with the Delaware.

When the statement of the performance of these two kinds in my hands was made to Mr. Longworth, he affirmed strongly his belief that "neither of the kinds (Delaware and Diana) in my hands could be true," and he could only be convinced by receiving vines from me, and testing them in his own grounds, where the Diana, to his astonishment, even produced better results than it had with me.

Meanwhile, the vines of the Concord that were first disseminated bore fruit in many of the different States, and although it became often better than at Boston, it everywhere exhibited a large measure of its defects and want of goodness, which are radical, so that it could not anywhere be called a good grape by the side of the Delaware and Diana and the other best kinds that have been described. Wherever these kinds were brought into use, Concord, with rare exceptions, became at once distasteful, and ceased not only to afford enjoyment, but was rejected from use. My own opinion only concurred with that of all who were able to appreciate the excellence of good grapes, and I could not recommend the vines for dissemination under the apprehension that buyers would soon regret having planted them.

It is true there are some idiosyncratic tastes in grapes as in other things, which will adhere to the bad for their defects and reject the good for their excellencies, but these are rare exceptions and should meet with compassion for their imperfect perceptions.

The Hartford Prolific was even more objectionable and not to be recommended. I dug up and threw away a large part of my stock vines, which had been obtained at a very great expense, although the vines commanded readily a very remunerative price, and were so easy of propagation that ten vines of Concord that would satisfy purchasers could be more cheaply produced than one Delaware, of which fact no one was earlier or better informed than myself.

The labor of introducing the Delaware was much greater than I could have anticipated, and some opposed its dissemination with zeal that would have been very commendable in a good cause, but the work is now well done, and the grape has left its detractors on an unenviable eminence where their goodness would never have placed them. I have never regretted my decision, and hope my children will esteem it a better inheritance to be able to say, "My father labored zealously for the dissemination of good vines, and the knowledge of their cultivation

among the American people," than to be able to say he acquired great wealth by the dissemination of the Concord and other poor varieties, which can have existence only until the truth becomes known.

Means not warranted by the merit of the vine will continue to be used for giving it reputation and dissemination, but none need be disappointed who desire to be informed as to its exact quality and worth. It may be stated in conclusion, that the gentleman by whose recommendation, by his high character and standing, it has been in a great measure sustained, has recently given a public retraction, saying that it "can not stand by the side of Delaware and Iona, etc., as holding any value for a fruit, and that it has become so distasteful to him that he can not eat half a dozen berries of it at a time." He may be considered a representative of all who have continued to adhere to it for a time.

The Concord has performed its mission, which was to teach those who had become discouraged by their unsuccessful efforts with Isabella and Catawba, that a more hardy kind would succeed. We have now earlier and more hardy kinds than Concord, which have all of the excellence that belongs to the grape in its richness, purity, and refinement, and these, as already stated, are superseding the inferior kinds as rapidly as they can be disseminated, for the Delaware *has* in a measure already "educated the American taste," and next season not less than one hundred thousand more educating vines will be in bearing in thousands of yards and gardens.

I would not be understood to say that the Concord should be excluded from all collections, but that from its lack of merit, it will not long constitute an important item in any. The past season it has rotted often as badly as the Catawba. In market, it has often, for a short time, maintained a respectable position for price, but in a little time, having to sustain a trial upon its merits as a fruit, it has always fallen very low, generally to half the price of the Catawba, and less. I have a fine stock of the plants, produced in the best manner, for garden planting, at very low prices.

Extracts from Letters.

I offer a few letters in exemplification of statements made in the Catalogue, which clearly and forcibly illustrate important points also made in Mr. Meade's lecture.

The vines from which Mr. Eaton's premium grapes were taken, were those of one year old, best selection, and the grapes were produced the second season from planting. Three points are clearly proved: the excellence of the Delaware, the superiority of the vines, and above all, their judicious treatment by Mr. Eaton, without which the results could not have been obtained; but good treatment is exceedingly simple.

Westchester County.

Editor of Horticulturist: My attention was first called to the Delaware Grape by an article in your excellent magazine, the Horticulturist, some two years ago last Spring, at which time I moved on to a small place in the country, a short distance from Troy.

The same Spring I purchased from a Western house a few Delaware vines, (a larger portion of which, by the way, turned out to be any thing but Delawares,) and the following Fall I received a few vines from Dr. Grant, (that were simon pure,) and send you, accompanying this, a few bunches I to-day cut from one of the vines had of the Doctor. Can any one at the exhibition (grape) now being held at No. 41 Park Row (which I designed, but am prevented attending) show better and finer bunches of Delawares from so young vines, having but ordinary care and culture, and grown, too, in a very exposed situation?

I have grown a number of other varieties, set at the same time; and notwithstanding all that has been said and written about the Delaware being a poor and feeble grower, etc., I have not on my place a vine of any kind that has done better or as well in every particular as the Delaware; and when the quality of the fruit is brought in question, words are not to be found in my vocabulary to express the excellence of the Delaware over all other kinds grown out of doors; and I sometimes think I prefer them to the foreign kinds I have growing under glass. But not to be tiresome, have I not succeeded well with my Delawares? Are they not good?

"I have some six hundred feet of grape trellis, and some dozen varieties of grapes growing. I now wish I had but one variety and that the Delaware. Dr. Grant and yourself have not said half enough in its praise. Very respectfully yours,

Troy, N. Y., Sept. 30, 1863. E. O. Eaton.

Mr. Eaton received the prize "for the best five bunches of Delawares," for these, at the New-York Grape Show, at the Agriculturist Office.

I make an extract from a letter by one of our most distinguished horticulturists on a visiting tour in the vicinity of Hartford:

"Although I shall see you soon, and tell you how gratifying the sight which the excellent performance of your vines has almost uniformly afforded, and always when your directions have been followed, I can not forbear mentioning a few instances in this letter. One is a case in Manchester where vines of your production, three years from planting, are carrying a crop of Delawares that are worth a journey to behold, by the side of those from another quarter, five years old, for which a much larger price was paid, and which have not one fifth as much weight of fruit of an immeasurably inferior quality. The purchaser showed me, by calculation based upon the value of the fruit now on the vines, that your vines were cheaper at the price which he paid than the others would have been if he had received them free with a gratuity of two dollars each with every vine. Mr. Mottier was right when he decided to plant none but your best Delawares."

Dated, Hartford, Sept. 4, 1863.

Troy, Nov. 7, 1863.

Dr. C. W. Grant: Dear Sir: A few days since I called at your establishment, and was exceedingly well pleased with all I saw there, but was displeased at being told I could not have half an hour of conversation with yourself, and I left, giving you no order.

I had seen an advertisement stating that "first-class vines were produced at the establishment named, by an improved process so cheaply," that I hesitated a little as to going. When I saw the vines, I did not doubt the *cheapness o the process of production*, but I also saw that I should have to take them to Saratoga with me to keep them alive through the next season.

Their process was certainly very much cheaper than yours; the word "improved" should have been omitted; I need make no further comment than by sending my order to you. *I may say their second class pleased me just as well as their first;* and their third! They told me that staking them as you do, and removing the laterals to get one well-ripened cane, was disadvantageous. I should like to see them attempt to stake theirs. Respectfully, James Bates.

Chicago, Nov. 20, 1863.

Dr. C. W. Grant: Dear Sir: Four years since you gave me a plan for growing vines and trees in our not very genial climate or soil.

I hope you may publish an engraving and description of the plan in Landmarks, for general benefit.

The Pear-trees have done well, but the vines deserve most honorable mention.

We have looked upon half of the produce of the one hundred Delawares as our own, and the other half as belonging to the needy. I gave one hundred dollars to the Sanitary Commission from the proceeds of the devoted half, and have more than that remaining for other purposes besides reserving one hundred pounds for the sick, in a cabinet which you have taught us to make. They are so much more winey and refreshing than those from the houses, that we have ceased to desire the foreign kinds, as you assured us would be the case.

If all of your promises are as fully honored as those in regard to the Delaware grape, no protest will meet you *anywhere.*

Yours truly.

The Quality of Grapes. By R. G. Pardee.

"Our tastes are in some good measure the result of education. When first called upon to judge of a new fruit, we are liable to err, by reason of our imperfect stand-point of comparison or prejudice. Some persons' tastes never become reliable. It requires, at all times, a very nice discrimination, and no small amount of judgment and experience.

"In the question of the comparative merits of our delicious native grapes, time and experience are working out the most important results. During the last three years the writer has taken especial pains, not only to cultivate his own taste, but also to test the numerous varieties under multiform culture, climate and soil. The past season hav-

ing afforded superior opportunities to complete the test, the results are herewith given.

First stands the refreshing Delaware grape. It seems to be decidedly superior to all others in agreeable richness and flavor, melting pulp, and acceptableness for the table, or for wine.

"Having called to my aid more than a score of ladies and gentlemen of cultivated taste, their unbiased opinion, expressed in every case during a period of three weeks, was, that the Delaware stands decidedly ahead of all others. Of many specimens of the Delaware grown in various localities, clearly the best and richest flavored ones came from Dr. Grant's oldest vines at Iona.

"Second. Next we must place the new grape, 'Iona,' in so far as one season will permit us to do so. It is decidedly superior to the Diana or Catawba grapes, in point of flavor or agreeableness. By some it may be preferred to the Delaware, as it is more sprightly, although our taste prefers the latter. It seems to combine more than the good qualities of the Diana and the Catawba, but it does the more nearly resemble the latter.

"Third. The Diana comes next. It has been very superior this year, and sustains its well-known reputation.

"Fourth. I must place the new seedling 'Israella' next in quality, and superior in earliness. It is the best, the most sugary and tender-fleshed black grape I have yet tasted. Ripening as it does, about three weeks before the Isabella, and being so much superior in flavor to the Hartford Prolific, or even the Concord or Isabella, it must come into universal demand, if it sustains in subsequent years the promise of this.

"Fifth. The Concord has done well this year. It does not overbear, and the quality of its fruit this year equaled its best promise of former years. It is quite a favorite with many, although in point of flavor it will not bear criticism.

"The Rebecca, the Anna, and Allen's Hybrid have furnished some most delicious white grapes, and well sustained their former reputation, and some other varieties I might name, worthy of attention, but after particularizing the above, I am quite content to make my list a very short one. Methinks an abundance of those which I have enumerated would soon lead us to regard most other kinds with indifference. I am glad to observe that Dr. Grant is propagating Nos. 1, 2, and 4 in liberal quantities, with improved culture and extraordinary success.

"[We are obliged to you for your notes on the 'Quality of Grapes. Seeing grapes as you do, under a variety of circumstances, you should more frequently give the results to the public. We think you have given the true relative position to the Iona and Delaware. Some, as you say, will no doubt prefer the Iona, as it is almost as good as the Delaware, and its size will determine the preference with some. The Delaware and Iona are the most valuable grapes we have at present.—Ed.]"

Extracted from The Horticulturist, by permission.

Extract from a Letter from Mr. Charles M. Beach, of Hartford, Connecticut.

Circumstances now permit me to make a very favorable report of the progress of the present and past seasons.

I did not begin to prepare for my vineyard until after pretty thorough investigation had convinced me that nothing better could be done than to follow your directions in every particular. My ground wore a very forbidding aspect to a beginner, being both very hard to work and in need of thorough drainage, but I am happy in being able to say that no failure or disappointment has occurred in any one point except that the performance has uniformly surpassed my most sanguine expectations as well as your promises. My only regret is, that the work had not been commenced two years earlier and prosecuted with greater vigor; but the experience of the past two years was needed to give me full assurance in regard to climate, and various other matters pertaining to an undertaking of such magnitude and importance as planting a vineyard that is intended for long duration as well as excellence of produce.

I feel now that there is safe ground under my feet, and that the undertaking may be prosecuted with any economical amount of energy that circumstances will permit. We are using our utmost diligence in getting another acre ready for fall planting, and must claim the performance of your promise to call and see that all is right before beginning to plant. The bushels of Delawares and Dianas with which the vines are now loaded, when only on their second season, and the excellence and beauty of the fruit, and the strength and ripeness of the canes, have warmed me with an enthusiasm for the work that is not unmingled with gratitude to you for the full and explicit directions given in your Illustrated Catalogue and Landmarks, and also by letter.

Dated Hartford, September 18th, 1863.

Mr. Beach received premiums for his grapes at different exhibitions, in competition, as usual, with those from much older vines, from which he has a right to draw further assurance of the correctness of his course of proceeding.

This letter is taken from among a great many of the same import, because it very happily and fully illustrates the important circumstances of a very successful vineyard, of which it affords an unexceptionable example. The exposure was favorable, being a southeasterly declivity, but the other conditions were *made* so by the efforts of Mr. Beach.

Extract from a Lecture by Peter B. Mead.

Success in Grape Culture depends upon the proper selection of varieties, upon the quality of plants as affected by propagation, and upon the treatment in garden and vineyard.

In speaking of the cultivation of the vine, Mr. Mead remarks: I have been a devotee of the vine for the past twenty years, and have studied it carefully during that period for the love of the subject and the immense interest that attaches to it, and I may claim a degree of accuracy and extent of practical knowledge in regard to it superior to that of any person in the country, with one exception. I have labored zealously in the cause without any hope of reward except the consciousness of the great good that must result from it. While the people are rapidly learning the value of the grape in its excellent kinds for plentiful use in the family, and cultivators have learned the profits of well-managed vineyards, and are beginning to plant vines in great numbers, very many will be disappointed in their expectations in consequence of not fulfilling the conditions of success. The first and greatest cause of failure is that of using too cheap and consequently poor vines, which are expensive in comparison with the best even in the outlay of money before they can be brought into profitable productiveness, to say nothing of the extensive losses that will occur by the death of the plants. Persons can not know until after years of trial how important it is to the large measure of success which renders the cultivation of the vine so pleasant and profitable, to obtain the right kind of plants to begin with. It lies at the foundation of success, and with such vines as I now show you full success is more easily attainable than in the cultivation of any other fruit, while with very poor vines it is scarcely attainable at all.

Here are seven grades of vines from single eyes, with very nearly equal intervals of quality, as indicated by their roots and other marks which are clearly apparent to the habituated eye.

The highest are called "Best Selection," which means that they are selected for remarkable value from the class called Extra, which I now exhibit. The primary and secondary roots, covered with their fibers and rootlets like a thick head of hair, seem to leave nothing to be desired, but this one which I now hold up to you is still better and more mature in its development of the same characteristics that are so satisfactory in the one last shown. This is called Best Selection. These are both grown in large pots, to which they were introduced by a long succession of changes, and they can be produced in no other way. Observe the fiber and strength of action all at the center, where it is needed to become effective, like the rays spreading in all directions from the sun. These are most excellent, but necessarily somewhat expensive, costing not less than one dollar in money each to produce them, with the most skillful and unremitting attention added. A calculation based upon facts shows that by the worth of its fruit over a good vine like the one marked No. 3, at three years old, the one of Best Selection, at a cost of one dollar, is cheaper *by two dollars* than the one marked No. 3 at fifty cents; and next season the advan-

tage of the Best Selection (at four years old) will be doubled. This is not an exaggerated instance, but a fair representation of every day occurrence. I would repeat the assertion that I am often compelled to make, that the best are emphatically the cheapest, as fully demonstrated by innumerable trials.

The reader will understand that Mr. Mead exhibited specimens of the different kinds and grades as he was speaking, for which Plates Nos. 5 and 15 may serve tolerably well as illustrations.

Here are the same grades (Extra and Best Selection) that were begun in pots and finished in the open ground, that have nearly the same value, the roots being larger and the vines also, but not so hard and fibrous. They had attained a good size in pots before being put out, and have all of the advantage of the transplanted vines of two years, with the additional advantage of carrying more of their excellence of constitution into immediate effectiveness than is possible with the vines of two years, when planted in place to fruit.

Here are No. 1 vines for vineyard planting of excellent quality, and such as will not bring any disappointment; and here are No. 2 and No. 3. All of these are excellent vines, and refreshing to behold, for they all speak of a good measure of success speedily, but each grade removes the period of establishment in bearing about one year, and when nearing the lower grades supposes a degree of attention by the cultivator which they are not likely to receive. Here are Nos. 4 and 5, which are still much better than very many that are sold for the best vines, and good healthy vineyards may be made from them; but there is no need of repeating what I have said in regard to the economy of the best vines. Here are vines two years old transplanted and root-pruned, and here are vines that have been well treated to the time of their establishment in bearing at four years old. I will now prepare all of them for planting by proper pruning. . . . .

Now these are all in proper condition for planting; and although the one four years old will give some imperfect fruit the first season, it does not take so much of the effective apparatus of the vine with it into the ground at transplanting as those called Extra, Best Selection, and No. 1 Transplanted, and at three years from transplanting it will be greatly below any of the three in the value of its produce.

It is time that this wrong idea of the increase of the value of vines by age was entirely got rid of, for it is constantly leading to the most serious disappointments through great expense. All vines, to be valuable and give good permanent results, must, whatever may be their real age, be brought to the condition of one year old vines, for it is only the roots and wood of one season that are of any value for transplanting.

The simple statement that a vine is two years old, and has been transplanted, although it gives an important circumstance concerning it, does not fully specify its value. A vine that is pretty small at one year old, if it has maintained its health through the entire season, may be made to become a pretty good plant at the end of the second, by transplanting and root-pruning, if it receives besides the large amount of additional care that is required.

Without transplanting and root-pruning it will become a much larger vine, and more attractive to some people, who do not know how to estimate its quality; but the fiber, or secondary roots, near its center, upon which the value of the plant chiefly depends, will be lost, and with it nearly one year of time, at least.

By those who are unacquainted with the important characteristics of vines, the one not transplanted would be preferred, from its greater size; but the practiced horticulturist, or vineyardist, who has learned to judge of the vines by their ability to produce in the garden or vineyard, will not hesitate a moment in choosing the one which has its secondary roots where they can be available, rather than at the extremities of the two-year old roots, where they are all lost by the necessary cutting back at planting.

In this way many tolerable vines of two years old, transplanted and root-pruned, are made like those that I now exhibit.

But the *best* vines, two years old, transplanted and root-pruned, can only be produced from the best one year old single-eye plants, like the one I now show, by pruning it to the form which it now presents, (showing it with the roots cut back to about eight inches in length, and the cane cut to three eyes.) From the ends of each of these roots generally three new ones will be produced, (not certain in number—from two to five,) and along the entire length of the remains of the root that has been cut back permanent secondary roots will be produced, which gives the vine remarkable ability to endure and produce occupying the ground fully with working roots.

I have said that the vines which have been shown as single-eye plants, best selection, are the best plants with naked roots (naked in contradistinction from those grown in lattice boxes, or baskets, and removed with a sufficiency of the soil in which they were grown) that can be produced. I must qualify the assertion slightly. The plants of best selection, treated as we have just shown, are equal in all respects to the single-eyes, and have more ability to endure the trials of the first season without injury, and especially where the ground is not in the most perfect state of preparation, from having been recently done, or where the attendance is not at all times as careful as it should be, and especially in regard to drouth. For myself, I could ask nothing better, for extensive planting, than the single eye, best selection, which I now exhibit. For the large majority of persons who treat their vines pretty well, (not quite so well as I shall teach them to do it in my book,) this of best selection, transplanted, is preferable.

I will now show you one of four years old, that has been taken up for sale, and it is a pity, too, that it has been taken up. It is a fine Delaware, and the crop of next season, which it is abundantly able to bear, would have brought more than the price now asked for the vine. Let us now prune it for planting. In the first place, cut one of its large canes entirely away, and then cut the other to three eyes, but one of which must be permitted to grow. Only the new root that has sprung from near the surface can be retained; all of the rest must be cut off, for it will continue dying for two or three years, until it has all disappeared, and the vine becomes a new plant. So it had better be done thus at once, as all experience teaches. Now you see the three vines, of three different ages, all reduced to the condition of one year old vines for planting. While you are looking at them, I think it may be seen that most of you, with your present light upon the subject, would take the transplanted of two years first, and that of four years last. You would be right; but I will state the case for you a little differently. For the experienced gardener, whose attentions are always bestowed at the right moment, the best selection of one year; for the attentive amateur, the transplanted best selection; and for the man who cares nothing about the matter, the vine of four years old. But the time is near when there will be no careless horticulturists, and when good vines, well attended, will be an essential part of every homestead; not to furnish a supply of a score, or a few scores of pounds, to last only a few days, but hundreds of pounds, for at least six months of the year.

The wish to obtain fruit so beneficial and excellent as that of the grape, as speedily as possible, is so commendable, that I am laboring to encourage rather than to repress it; and I desire, moreover, to put every one in the true way to obtain it abundantly, cheaply, of best quality, and as speedily as possible.

For general planting, the purchaser of the best plants, from single eyes, never does wrong.

But there are other kinds of plants, of one year old, that are unobjectionable in all respects, and will yield fruit sooner, and some of them immediately—that is, the season of planting.

The vine which I now exhibit is called a Layer, and is a good representative of the best quality of that kind of plant. This, you will observe, has two strong canes of bearing wood, each at least eight feet long. If these had not been disturbed, but suffered to remain in the ground where they grew, they might have been pruned to two feet each, and suffered to bear from six to twelve pounds of grapes the next season. In consequence of being taken from the soil, for removal to another place, their ability to bear will be greatly lessened, so that four pounds would be a pretty large amount for such a vine to bear the first season after transplanting.

It is only the best of layers, that are skillfully produced from strong healthy mother-vines, prepared for the purpose, that will do this. Ordinary layers have no such ability. Such plants are necessarily very expensive, but they are also very valuable. Inferior layers are the poorest of plants, and should be avoided. I will not now attempt to describe the manner of producing good layers, but leave the subject for the present, simply saying very few of them are produced. This one with abundance of secondary or fibrous root, evenly distributed in moderate compass, is a model plant. That with its long, primary root, and straggling, detached secondary roots is to be avoided.

I have here something that is new to nearly every one of you Very few of these have been produced in this country, and none for sale until last season. In speaking of the last I mentioned that its ability to bear was greatly lessened by its being moved from the ground. To avoid that check this one has been grown in a lattice-box or crate, so that a sufficiency of soil may be moved with it without being disturbed. This you will see by the size of the canes, and by the number, appearance, and equal distribution of its secondary roots, protruding on all sides from the box, is a layer of best quality. It is called a "box layer," or a "covered layer," in distinction from one taken from the soil like that previously shown which is called a "nude layer. Vines like this receive no perceptible check by transplanting and transportation, and give fine crops the first season, maintaining their advance over other kinds long enough to pay for their excess of cost, by their excess of produce. Such vines will cover a trellis with their beautiful shade the first season, and give at once the air of complete establishment, instead of raw newness, which detracts largely from the enjoyment of new places.

This vine is a present to me, and I need not say that I prize it more than I should six from single eyes of the best selection. It is an Iona.

In answer to the question, as to whether vines from single eyes are better than those from cuttings, the lecturer stated that they were, and that the superiority was easily demonstrable to the understanding of cultivators, but would occupy too much time for the present. A vineyard from single eyes, best selection, would give better results at four years from planting than one from cuttings at seven, and in point of durability there was no comparison.

The propagation of hardy vines from single eyes for open ground is an Americanism, and the feasibility and great advantage of it, in a large way, were first demonstrated at Iona Island.

In answer to the question, Are not hardy vines made tender by being propagated under glass? the lecturer said, by no means; but, on the contrary, with the proper appliances, the habituated propagator is thus enabled to command all of the conditions of success, which, in the hands of attentive skill, result in the production of perfect plants, such as I now exhibit to you.

Observe, not merely the quantity of roots, primary and secondary, with their innumerable rootlets, like a thick head of hair, but their uniform distribution, with their wiry hardness and strength. Try the solidity of the wood by cutting with a sharp knife, and its weight by seeing it sink in water; note the smallness of the pith, the fullness of the buds, the nearness of the joints, and the ripeness of the wood, even to the extremity.

The great superiority of such plants has been too often demonstrated by trial to leave any doubt in the mind of the most skeptical. They are not forced but judiciously treated for the benefit of purchasers.

I must be careful not to be misunderstood in regard to the production of vines under glass. I would not have it inferred that, because the best vines may be produced under glass, and by the aid of houses, none but the best are so produced. The very poorest have been so produced, and, doubtless, will continue to be, if the call of purchasers is for very cheap rather than for very good vines. The conditions of goodness and cheapness are in direct opposition, and purchasers will control the matter.

The art of propagation, when skillfully practiced, is one of exceeding nicety, and requires fine perceptive powers, thoroughly trained.

Vines produced in this way are necessarily expensive; such as I now show you can not have cost the propagator less than one dollar each. Those may be considered as of the best possible quality. I have never seen better. They are marked "best selection." Here are vines of another quality, much below the first, but still excellent. They are marked "No. 1," and may, perhaps, be produced at half the cost of the first. There is a class between them in development and value, called "extra." And here is No. 2 and No. 3, No. 4 and No. 5. These different grades it is not very difficult to determine; but to fix their real value, as it will be determined by their productiveness and the quality of the fruit borne by each grade, in garden and vineyard, and to exhibit the whole matter clearly, would require your patient attention for half an hour. I can give you the results in few words, on the side of safety. For the garden, plant, if single eyes, the best that can be obtained, and of layers the best, or none. For the vineyard, plant none of lower grade than the No. 2, which I show you, and far better none below No. 1. The most that have been planted have been below Nos. 4 or 5, which I now exhibit. Good vineyards may be made of all these grades, but to the best cultivator in the world who buys the vines it will cost more to make a vineyard of the inferior grades than of the higher, and the vineyard can not be so good of the former as of the latter, and much time will be lost. I did not intend to estimate the difference in value between vines of moderate and those of excellent quality. A part of the difference will be one year later in bearing. This amounts to the net value of the crop for one year after full establishment in bearing, added to the cost of attendance and interest of the investment one year. Shall we put the sum at one dollar? which is too low. This presents the case fairly in its true aspect.

But very few who plant vineyards are of the very best class of cultivators, and to these the difference will be greater; and for such to buy the lower grade of vines will be the most mistaken effort at economy.

It is only good vineyards that are both pleasant and profitable, and such I desire to see always.

An excellent vineyard of one acre of the best varieties may be looked to confidently for a more valuable crop than the average of four acres of cheap vines, in ground moderately prepared and rather negligently attended. One acre of first-rate vineyard is a handsome and valuable possession. A trellis of one hundred vines, in best condition, will, unfailingly, furnish more enjoyment for a family than can be obtained from an equal expenditure of means and attention in any other way.

It is well often to glance at the pecuniary value of even our most delightful things. A trellis of one hundred vines, trained according to the best method, will yield from one thousand to fifteen hundred pounds.

The best Delaware grapes have brought, the past season, sixty cents a pound. For years they may be expected to range from twenty to fifty cents a pound, according to quality. The best may be expected to command fifty cents. One half the produce of the trellis would afford a tolerable family supply, (not such as I intend for my family,) and the sale of the other half would pay for the entire attention of a well-kept garden.

If those who desire to obtain vines will acquire the information which they should have, in order to enter upon the course understandingly and safely, producers of vines will, per force of circumstances, be compelled to furnish good ones, for they will find sale for no others. My object in this lecture, chiefly, is to furnish such information; and if I could speak to all who are about to obtain vines, with my living voice, and could demonstrate the true course of proceeding, by the exhibition of the realities of the case, as has just been done, few that are capable of comprehending any subject fully would go wrong in this, which is not only deeply interesting but commends itself to well-informed common-sense at every step.

The production of good plants is the first step toward obtaining grapes, and the second, obtaining good vines in perfect order; but these steps, however well taken, are not, of themselves, sufficient to secure the accomplishment of its whole course.

After the vines have been obtained, two other steps, of equal importance, are to be made before the goal can be reached; the first of which is, the proper planting of the vines in suitably prepared soil; and the next is proper cultivation and training.

When these operations are unskillfully performed, the best plants often prove to be but little better than the poorest in their results, which is utter failure. These operations will be treated in subsequent lectures.

The whole lecture was very interesting, and presented the important facts more clearly than has ever before been done. I have permission to transcribe it all, but have not room for more.

Importance of Training.

Training is indispensable in a threefold relation. The vines can not remain productive without having it judiciously performed. Without it they soon become unhealthy, as well as uncontrolable.

Without a good system of training, the fruit not only fails to ripen early but it never acquires its full degree of spirit and rich refreshing flavor.

Plate No. 17 shows a good plan for training before a low wall, or fence, or on a low trellis. By taking sufficient time one vine, in this way, may be made to extend to great length; but this is not advisable. Plate No. 18 shows the same plan restricted to its proper limits. Plate No. 22 shows half the same vine pruned, ready for the beginning of the next season.

The arms of a vine may be extended in length, but the productiveness can not be greatly increased by increase of the height of the bearing canes. To increase the height, or to cover a wall or building to any desirable height, a plan, with successive stages, has been devised, by which this plan can be built into a system, as shown in Plate No. 20. Plate No. 22 shows one of the best vineyard plans. Plate No. 19 shows a plan of *bedding* in vineyards. For full explanations of these and many other plans see ILLUSTRATED CATALOGUE, and LANDMARKS, in which the subject is more thoroughly treated than in any single publication of any country. No engravings have ever been executed that can compare with those given, for truth, clearness, and accuracy.

Wine.

WINE has been a most esteemed production in all countries where vines have been found to thrive; and a good vineyard the most desirable of possessions.

There is no other branch of cultivation which so largely calls forth into full action all of the excellent spirit of man in his daily avocation, and in which the employment of all of the most manly qualities of the cultivator are so immediately and directly rewarded with a prize that is congenial to exalted and refined perceptions. This is the most important lesson which our rapid survey of France, in relation to the cultivation of the vine teaches with a living power that can not leave the question in doubt, and is such a solution as all good men must require before giving encouragement or even countenance to its introduction to our country for wine.

A beverage from the grape has been often made by very rude people, but *good* wine has always been the production of refinement and cultivation, and can only be sustained by a people advanced in the arts, knowledge, and elegancies of life. It belongs to quiet enjoyment as *strong* wine does to revelry and high excitement.

Those wines which contain a large percentage of alcohol, either naturally or by addition, may be called wines of intoxication; and the amount of alcohol which they contain may vary from eight to twenty per cent, and even more.

Those that contain little of alcohol, but cheer and refresh by their generous qualities, without inebriation, may be called wines of refreshment, and by those who can appreciate their good qualities they are rightly characterized as precious; for there is nothing so grateful and renovating to the whole man, when suitably taken, as excellent wine. Its beneficial influence is not transient, but promotes the healthful action of all the vital powers.

These wines contain only from five to seven per cent of alcohol, but so combined with other principles that the alcoholic action is little, if at all, distinctively felt, and are never used for purposes of dissipation. Their finer qualities are never fully appreciated, except by those whose tastes have been cultivated by their use.

Brandy, mixed with pure, delicate wines, not only destroys all of that freshness, delightful perfume and flavor which renders them in their excellence estimable beyond comparison with any other refreshment, but it changes their character from that of the most genial and invigorating restoratives, grateful to the stomach, soothing and renovating, to that of a stimulating excitant whose primary action at best is not pleasant, and whose secondary action is attended by feverish depression, headache, impaired tone of stomach, and general derangement of the system. The evil of the adulteration is not lessened by being made in the form of sugar added to the juice before fermentation.

Good wine is the produce of good grapes, only, and the excellence of wine depends upon the precious qualities of the grape, which no other fruit can produce; and these qualities, in sufficient degree and perfection to produce estimable wine, are only found in the best kinds of grapes, and not in these except when brought to a good degree of maturity, under the conditions that are favorable to the development of their excellent qualities.

Although this exquisite flavor is a delightful characteristic of our best grapes in which they are unequalled among fruit, it must be borne in mind that their chief excellence does not consist mainly in this flavor, only as it is indicative of the higher qualities of invigoration and refreshment which are never found without it. It may be said to be their physiognomy—the manifestation of their nature—and bears the same relation to their essence that the expression of a countenance does to character. In both cases rich enjoyment is communicated by the delightful expression of the qualities of the heart, teaching us where to "find the friends whose value is inestimable."

Grapes to produce wine must be rich in sugar and tartaric acid, and be free from malic acid. Our coarse grapes, such as Hartford Prolific, Concord, Creveling, etc., are not only destitute of the finer qualities, and poor in sugar and tartaric acid, but besides the nauseating offensiveness of their skins, they possess a damaging amount of malic acid in their unripe center; hence, these kinds have never been able to produce wine that has deserved the name. The kinds of grapes must be such as furnish *all the excellent qualities of the wine*, and none but those of high excellence, and with that excellence fully developed, can make good wine; for wine is but the juice of grapes changed by fermentation, and does not admit of any other change, or any addition, without destruction of its character.

Beverages which are *called* wine are often made of grapes that are not wine-bearing, (Vitis Vinifera,) and also of various fruits and acid juices.

We have Rhubarb wine, Tomato wine, Strawberry, Raspberry, Blackberry, Elderberry, and Currant wines, all of which are made alcoholic in some degree, by the addition of sugar that is suffered to undergo the alcoholic fermentation, or by the addition of alcohol direct, in the form of some kind of spirits.

And such is the case with the syrups or cordials named, from whatever material they may be constructed. No one ever becomes habitually a drinker of them for refreshment, for they are only unsatisfying seductions to the palate, and yield none of that grateful stomachic refreshment, to call forth the feeling of friendship toward them. If their use is persisted in, the alcoholic stimulant will be the object sought, and the taste and feelings will soon begin to demand it in the more simple and direct form of ardent spirits.

The qualities which give value to pure, rich, high-flavored grapes are still more distinctively perceptible in the wine than in the fruit, when the vinification is well conducted; and the taste that becomes once well attuned to the enjoyment of the wine in which these qualities are developed and preserved, can not turn to alcoholic stimulation, for it destroys all of the enjoyment which has been received from the wine, and the refreshing delight and renovation which the whole being, through the stomach, receives from that, have no resemblance to intoxicating excitement.

The first real wine produced in this country was made from the Herbemont grape by Mr. Nicholas Herbemont, at Columbia, South Carolina. Soon after Major Adlum made one specimen of Catawba wine at Washington. A little later, Mr. J. J. Dufour, while making great efforts to introduce wine-making at Vevay, in Indiana, by a colony of Swiss, succeeded in making wine from the York Madeira, which he called Cape grape as if from the Cape of Good Hope. He did not succeed in establishing it as a wine grape, but this was afterward done by Mr. John E. Mottier, who made excellent wine from it resembling Chambertin. To the late Mr. Nicholas Longworth, of Cincinnati, Ohio, the county is indebted for the long course of very expensive experiments which demonstrated the practicability of making excellent wine from Catawba grapes in the latitude of Cincinnati. Farther north it has scarcely, if at all, been successful. A number have gained distinction at Cincinnati, by the production of excellent still Catawba wine, foremost of whom is J. E. Mottier. Messrs. Werk, Bogen and others besides Mr. Longworth have also made excellent sparkling Catawba wine.

To Mr. Schnicke belongs the high distinction of having been the first to demonstrate the surpassing excellence of the Delaware grape for wine. After he had fully proved it to his own mind beyond a doubt by the uniform result of four years' trial, he rejoiced as only a German could who had made this country his home, but had not dared hope to find among its blessings so good a grape as the White Riesling. He then expressed his full belief that the Delaware would prove to be

act merely the best American wine grape, but the best in the world; and three more years of trial with the same result have served to justify his firm conviction. It is pure, rich, and generously refreshing with a somewhat spicy flavor, and smooth, with all of the sweetness that can exist in a perfect dry wine. It also makes a sweet wine by suffering the grapes to become over-ripe or shrivelled.

The first Delaware vineyard was planted by Mr. J. E. Mettler, with vines produced by myself. He has made wine from it two seasons, of quality greatly surpassing any thing that has been produced in this country, and rivalling the remarkable wines of foreign countries in purity, refinement, richness, and that exquisite delicacy of flavor, the whole assemblage of which constitute the excellence of wine. It has commanded more than three times the price of the best Catawba, which has heretofore been our only standard both of quality and price for native wine, the sugared wines so called not coming under consideration when speaking of real wines.

The price of Delaware wine when made in great quantity will probably be double that of Catawba, until the latter will nearly disappear from cultivation, and only be continued for a few special tastes, and for special purposes as the Cape now is in the hands of Mr. Mottler.

The Diana produces wine much more refined and delicate than the Catawba, and with many good judges it will for constant daily use fully equal the Delaware. It ripens so much earlier than the Catawba that it may be grown at least two degrees farther north, and it is much more certain in its crops. These two constitute the only wine grape that have been at present tested for the latitude of New-York, extending not much more than two degrees farther north except in specially favored localities.

The principles of wine-making are very simple, and the conditions are easily fulfilled after the proper grapes for the purpose are obtained. Good wine is simply the juice of grapes, fermented, without any addition or any change except that produced by the fermentation and the natural effects of time in ripening and developing the inherent excellences that are already in the fruit. The juice consists of sugar, tartaric acid, and glucose or ferment in large proportions, and other matters in small quantities, of which chemistry takes cognizance, besides those which constitute the specific excellences of different kinds, and which chemistry has not yet been able to recognize. Of the European grapes which are all descendants from those that originally came from Asia, there are many varieties that are wine-producing; that is, their juice after undergoing the vinous fermentation under proper conditions, remains in the form of a beverage called wine, for a long time, without undergoing the acetic fermentation by which vinegar is produced. But there are only a few out of the great number that have become distinguished for the excellence of their produce so as to be designated best varieties. These best varieties under different names are generally very widely disseminated, but a few by particular requirements of climate are restricted to particular localities.

All grapes that make wine are distinguished by what is called richness of flavor; that is, by a large amount of tartaric acid, with an abundance of sugar, tempered by the aromatic and other properties which constitute the distinguishing characteristics of each variety.

The grapes designated as feeble-flavored are not wine-producing in any country to the extent of furnishing wine for commerce. Among these are the numerous Chasselas varieties and Hamburgs. Grapes which have a large portion that remains unripe, which unripeness consists of malic acid, such as our natives generally, with their thick skins and tough centers, are unable to produce wine.

The Isabella, although not a wine-making grape, approaches more nearly to the production of wine than any of our natives of that class, leaving Concord, Hartford Prolific, Northern Muscadine, and all of the family quite out of consideration for that purpose.

The York Madeira is intermediate between the Isabella and Catawba in spirit and refreshment, and is of the lowest grade that can furnish real wine. The Catawba, under proper conditions, is distinctively wine-producing, and possesses a high degree of excellence marred by some defects.

These excellences or defects vary greatly according to the conditions of climate and season under which the fruit is produced. In the latitude of Cincinnati, where the seasons are distinguished for high temperature, long-continued and dry, the thickness of skin and unripe portion almost disappear, being elaborated into excellence that is suspended in the juice. Under such conditions the juice for the best Catawba wine is produced; but in the latitude of Cincinnati, in unfavorable seasons, the wine is inferior from the best attended vineyards, and in those which are neglected, it has no enduring ability without adulteration. Under such circumstances, sugar, or alcohol, or both are added, and a production results that is sold under the name of "Sweet Catawba."

In localities where the climate is less favorable the excellence that would come from the perfect elaboration of the portion near the skin and at the center, being absent, the product never results in real wine, and is never offered for sale unadulterated. For latitude and climate less favorable than that of Cincinnati, earlier ripening varieties of the rich, wine-producing kinds are required. Such kinds as Concord, Hartford Prolific, Creveling, etc., never become wine-producing in any latitude where they have been tried. When taken to Cincinnati and farther south and west in the state of Missouri, nothing that is capable of giving any of the benefits and enjoyment of generous wine has yet been produced from them.

Good wine-producing fruit must first be obtained thoroughly ripe, all of the imperfect berries being rejected. The crushing of the fruit must be thoroughly and evenly done without breaking the seeds. Very strong pressure is required so that all of the juice may be obtained, and this is not merely necessary for the purpose of saving the juice, but the properties of the grape that are obtainable by the severest pressure, as well as "the first running," are necessary to produce the best wine. The different qualities of juice are obtained from each quantity that goes upon the press, called "first," "second," and "third pressing;" and these three "pressings" or "runnings," in the proportions in which they come from the best grapes are necessary to produce the best wine. The first running will soonest mature to become drinkable, but lacks both richness and endurance. The last pressing, if kept separate makes but very poor wine, although equally important to the whole composition.

A thorough fermentation is required in a pretty equable temperature, which must be neither above nor below certain degrees. Fermentation will not take place with sufficient energy to make wine at a temperature below sixty degrees, and the quality of grapes must be very good and rich in sugar that can sustain a temperature above eighty degrees. For furnishing these conditions a cellar is required with the means of regulation so that the effects of sudden cold shall not be felt in checking the action which should be continuous, nor the effects of too great heat which will damage or destroy the wine by too energetic action.

With a cellar two-thirds under ground, having abundant means of ventilation or confinement of the atmosphere, and sheltered from the direct action of the sun, these conditions are easily furnished. There are two different plans for managing the juice during fermentation:

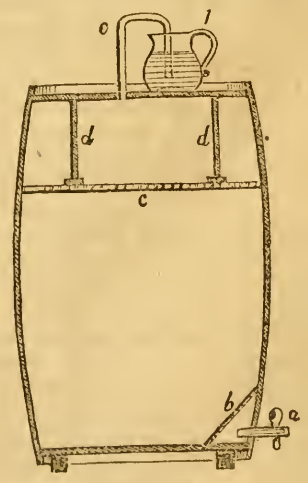


Plate No. 24.

one is to exclude the atmospheric air after fermentation has begun, and the other is to put the juice in a tub or vat, leaving it uncovered, except by the crust that forms upon the top, or covesed with boards or canvas.

The other is by using the apparatus represented in the plate, called the invention of Gervaise, by which the action of the air is chiefly excluded. The bent tube is fitted to the bung of the cask, and its upper end opens into a vessel of water, which prevents the ingress of air, but permits the gas generated by fermentation to escape freely by rising through the water in bubbles.

At the beginning the casks are filled only to within a few inches of the top. As the fermentation progresses toward completion, one plan is to fill the casks by repeated additions so that the scum will overflow and escape. Another method is to retain the scum, letting it settle to the bottom, where it forms what is called "Lees."

Wine of the highest character is made in both ways, and the full examination of the subject requires more space than can be afforded at present. The best wines that have been made in this country were by retaining the lees, and suffering the wine to undergo its second fermentation before their removal. This is called "wine fermented on the lees." It was by J. E. Mottier. After the fermentation has ceased the casks have the bungs driven tight, and remain so until the warm weather of the next early summer, when a second but much more moderate fermentation takes place, at the end of which the wine may be said to be made, but not fully completed. Another year in the cask, and some fining by isinglass, or white of egg, is generally required, when it is ready for bottling, and for sale, but not yet in its best condition, for which one or two years more in the cask are required, when it will be ready for bottling and use in ripe condition.

This is a general outline of the process by which any one who has juice of the requisite quality can make good wine; but it will vary in goodness according to the degree of accuracy in fulfilling all of the conditions of success.

For ascertaining the quality of the juice in regard to quantity of sugar, an instrument called saccharometer is used, and the degree of ninety or upwards is required for very good results.

This subject will be fully treated in LANDMARKS with numerous engravings.

The Profits of Vineyards.

This is a subject too extensive to be treated in narrow limits. It may be safely said, in general, that no branch of cultivation offers so good profits, and with such constancy for the amount of care and capital employed, and in all the pleasurable circumstances and associations attending it as the vine.

Vineyards for table-grapes, advantageously situated, at present offer the most attractive inducements to cultivators, where among other favorable conditions is that of easy access to market.

A great variety of considerations will affect the result both for table and for wine, the most important of which are situation and exposure; certain favorable conditions of the soil are also indispensable, although the vine will thrive in as great variety of soils as any other fruit. In every good garden these conditions are always present; for in making the conditions of a good garden, the proper conditions for the vine must be furnished, except that it does not require extreme enrichment.

In the chapter pointing out the different methods of training the produce per acre, will be found noted, according to each, under the supposition of good attendance, so that the question need not be considered here.

Prices will take as great a range according to quality in the hands of different cultivators as will the quantity produced. It must be remembered that the public taste is so far educated already, that not only the best kinds are demanded, but the best of the kind, and that the difference here will be as it now is in grape countries, not merely great between tolerable and best, but several fold.

In the market of Paris *excellent* Chasselas grapes bring constantly three times as much per pound as those that are simply good. Excellence should be the aim of every one who plants vines, both on the score of profit and of pleasure in the occupation.

Simplicity of training is a consideration second in importance only to that of efficiency. The most simple of all is when a single cane is trained to a single stake. The utmost that such vines may be expected to produce are three branches. By increasing the canes to three the system becomes admissible, and may be very productive. The number of vines per acre would be not less than six thousand, and each one might be expected to produce one and a half pounds of fruit. These can not be maintained in health, except by repeated beddings, as represented in plate 19. At pruning, each cane is cut to one bud, or better all removed but one, and that cut to three buds. By this means the vines are kept in the same form as now seen in plates 27, 28. Plate 25 represents a vine without support, and the condition is little different from ordinary vines, with one stake upon which the fruit is generally borne at the top, but from stocks in the form here represented. Plate 26 represents a very good plan by which the vines are planted two feet apart in the rows, and the rows not less than seven or eight feet apart. Each vine has but one arm, two vines being brought together by the stocks which at first sight appear to be but one vine. It is a renewal plan, and a modification of that by Speechley, the vines being about four feet long; for the detail of formation, see plates No. 29, 30. About twenty-five hundred vines will occupy an acre, and under the best management, which will be rather difficult, four to six pounds to a vine may be expected yearly, or even more. Plate No. 31 represents a better plan by which the vines will be set four feet apart in the rows, with rows six feet apart; something more than two thousand vines will be required for an acre, and from six to twelve pounds may be produced by each vine. This is a half Thomery row, here represented before a wall five or six feet high, but the plan is equally applicable to a trellis. Plate 34 represents a single member of the plan. Plate 31 represents the plans of 27 and 28 applied to a trellis, with the number of canes increased. In this form it is a very good one for obtaining large crops. The remarks in regard to pruning this form apply to those. Plate 33 represents one of the best vineyard-plans, and equally adapted for the garden. At least two thousand five hundred plants will be required to furnish an acre by this plan, and four pounds of best fruit may be obtained perpetually from each vine; for simplicity and efficiency either as renewal or permanent it is not surpassed. Plate 37 represents a plan for obtaining roots at each end of the stock. Plates 33 and 34 are ornamental for the garden. Plates 39 and 40 are a plan for the garden, of which 39 is the beginning, and 40 the continuation; but three more are required for completion. It is extended and difficult, suited only to the habituated.

For the farther development of the subject of training, see Illustrated Catalogue and LANDMARKS, where it is still more thoroughly treated.

Plate No. 25.

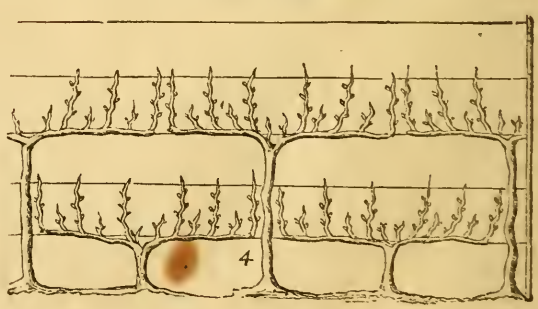


Plate No. 26.

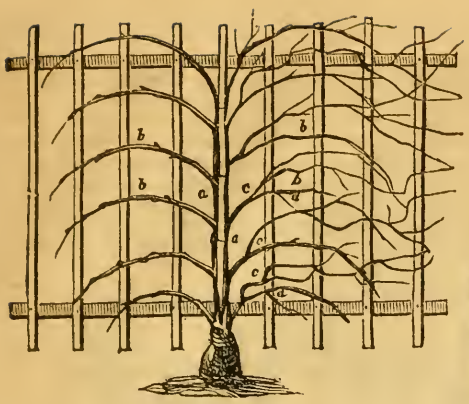


Plate No. 40.

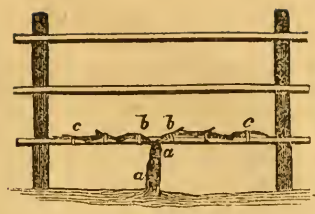


Plate No. 29.

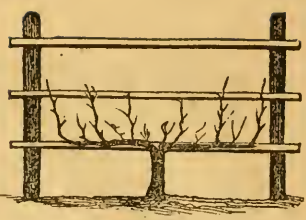


Plate No. 30.

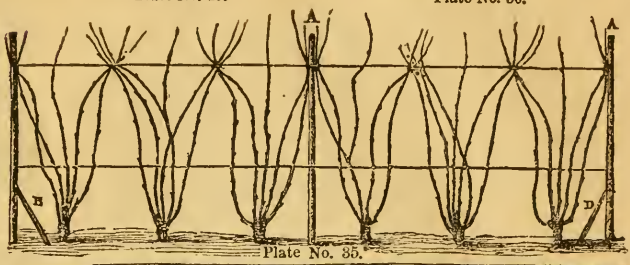


Plate No. 35.

Plate No. 38.

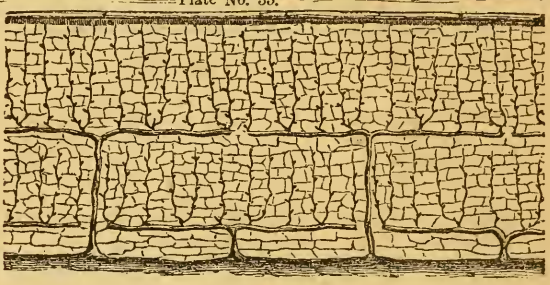


Plate No. 31.

Plate No. 28.

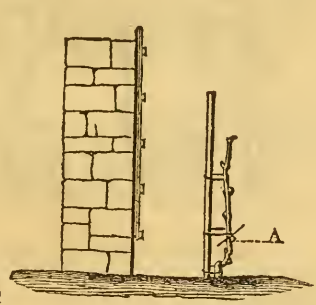


Plate No. 27.

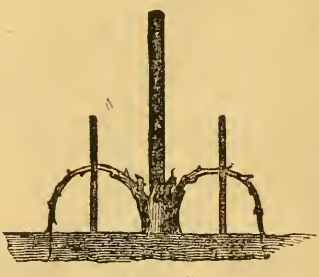


Plate No. 37.

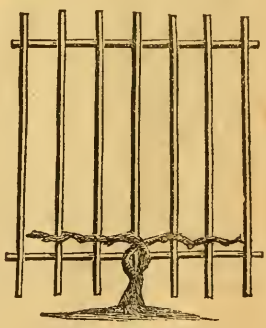


Plate No. 39.

Plate No. 33.

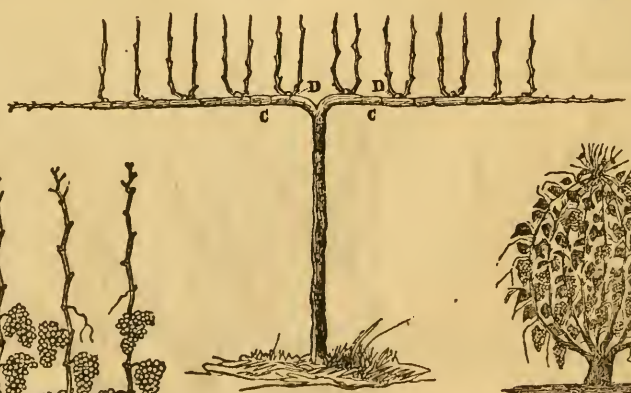


Plate No. 34.

Plate No. 36.

My purpose here is only to show that the subject of training is one upon which much study and careful observation may be expended without exhausting it; or, on the other hand, that its rules are so simple and well defined, and may be so clearly represented, that by using the experience of others as a guide-board, a child may easily comprehend and carry out one of the best plans for any purpose in the garden or vineyard.

The best and most simple plan for covering a wall from eight to ten feet high is the Thomery, as shown at page 16, plate No. 20; and for a wall five or six feet high, a half Thomery, as shown by Plate 31.

The simple elementary *plan* from which all half, three fourths, or full Thomery or double Thomery *systems* are *composed* is that shown by Plate No. 17, and again a little modified in Plate No. 18, and again in Plate No. 34. Plate No. 17 is a plan for covering a wall or trellis not more than three and a half or four feet high, and is essentially the same as that followed most extensively in the Medoc vineyards, but with arms three feet each, instead of two or two and a half, as is generally the case in the vineyards. Nos. 26 and 40 are each plans for covering walls or trellises eight feet high or upwards, and both accomplish the object very well, but not very simply. No. 40 is very defective in this respect. Plate No. 41 is the detail of the plan advocated for that purpose by Speechley, and C. Hoare. It is not difficult of accomplishment by a thoroughly experienced gardener, who is well acquainted with all that pertains to the habit of the vine, but is not easy of execution for a beginner, and requires constant attention. Nos. 42 and 43 accomplish the same thing much more speedily, as well as more simply. All of these, except No. 43, are renewed plans. No. 44 is designed for the same purpose, but is drawn to a scale half as large as the other. The standards (cordons) are obliquely set, and in consequence have some important advantages over all of the others, and from the same cause the bearing canes (coursons) all spring from one side. Nos. 42 and 44 are modifications of 43, each for the accomplishment of a different important end. No. 43 affords the most simple, expeditious, and effective mode for covering a wall with foliage and fruit, with a further most important advantage of having any defect from mismanagement or error easily remedied. No. 44 is only behind in all of these advantages in a little additional complication of trellis, consequent upon the obliquity.

Plates Nos. 45 and 46 are contrasted plans, as are also Nos. 47 and 48. No. 49 shows a simple dwelling greatly improved in beauty and comfort by a covering of vines, which are able to bring an important income, besides furnishing a family supply for six or eight months. No. 50 shows plan of No. 33 in a system by which the rows are made six feet apart, well adapted for steep hill-sides. No. 51 represents a small cottage also covered with vines. Plate 52 shows plan of planting to cover the side and roof of a stable. Plates Nos. 53 and 54 show method of preparation for laying down and covering for winter; the first to be laid *below* the surface, and the second *upon* it. To save the beginner from bewilderment or error in choice of plans, the best for a great variety of purposes are pointed out in the Illustrated Catalogue, where the following plans for training on buildings are fully explained.

This part of the subject deserves much more attention than it has received, and it is not more important from the fact that the fruit thus produced is the most cheaply and certainly obtained and of surpassing excellence than from the large amount of comfort afforded by the shade and from the extreme beauty of the covering. The best manner of training and the peculiar order in planting are easily understood from the engravings, with the aid of a short explanation.

Plate No. 41.
Renewal Plan of Speechley, and Hoare.

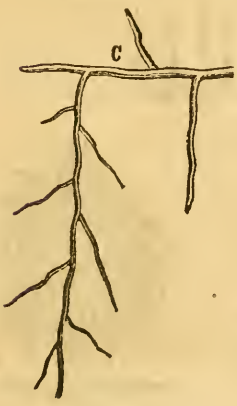


Plate No. 44.

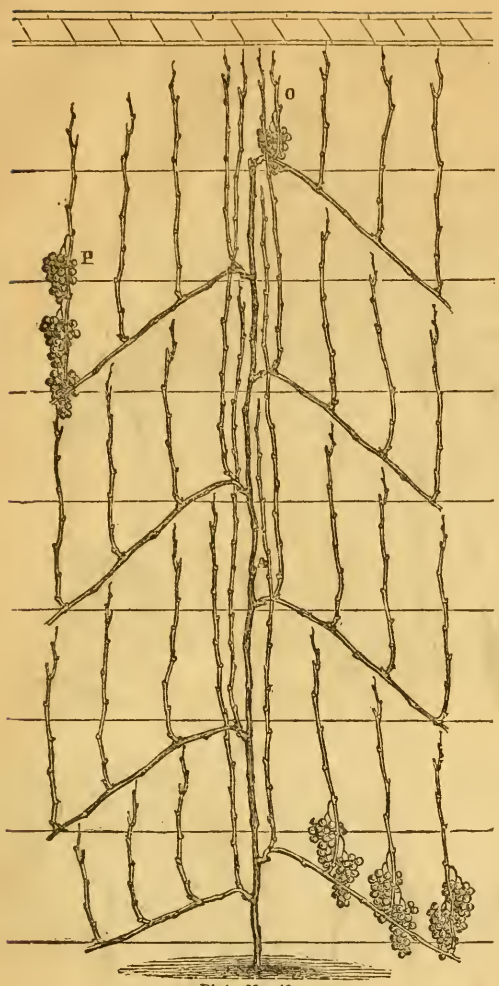
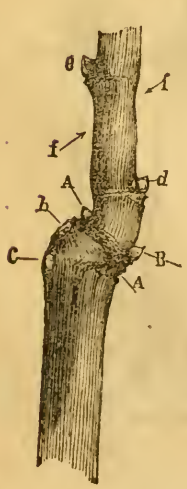


Plate No. 42.

Plate No. 43.



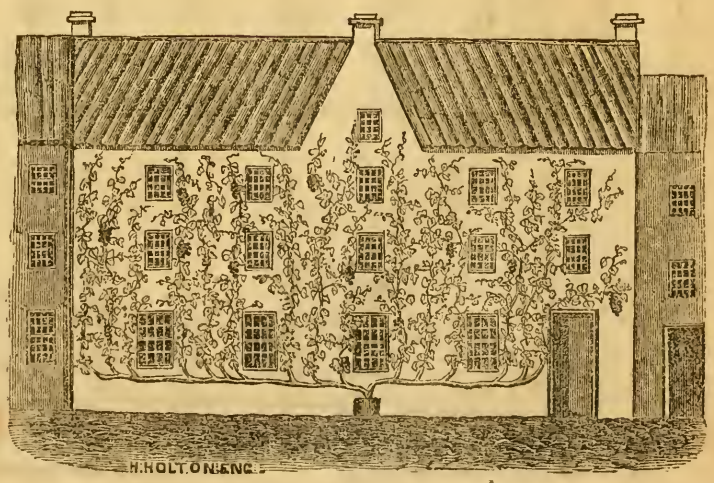


Plate No. 45.

A celebrated historical vine under a bad plan of training and little productive. Some gardeners, who visited it, expressed their disappointment by representing the vine—See No. 46.

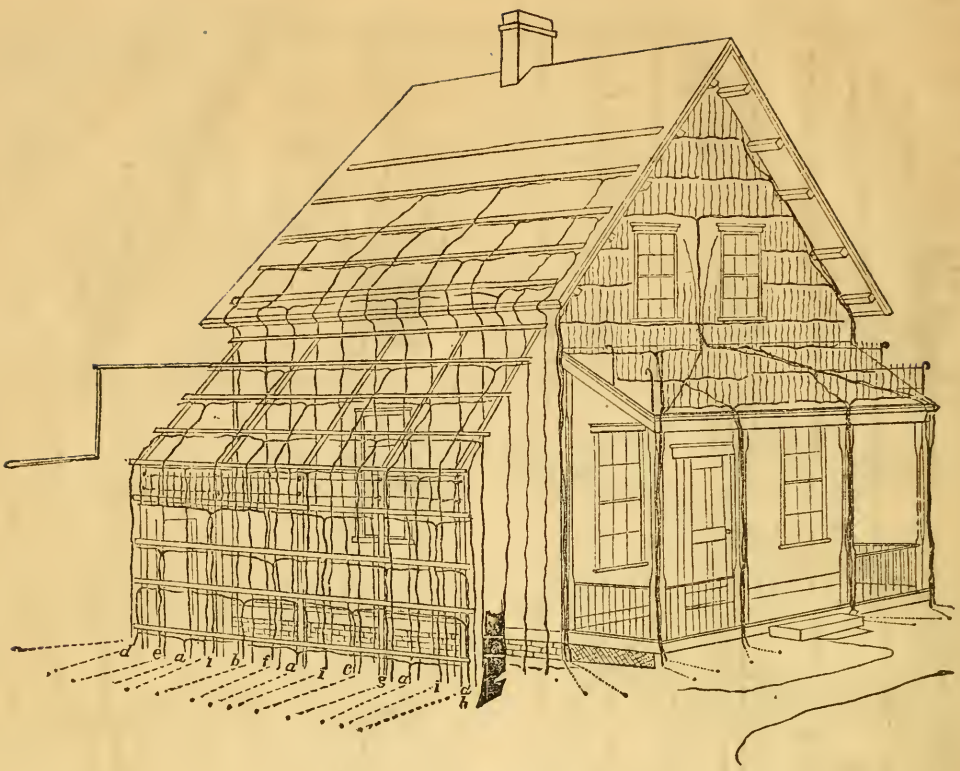


Plate No. 49.

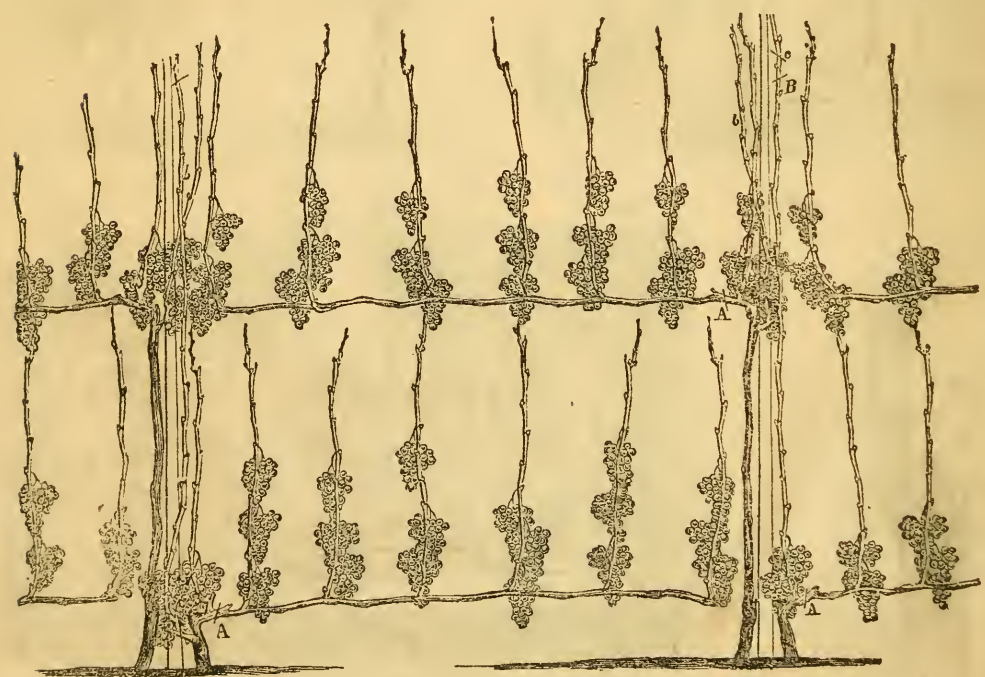


Plate No. 50.

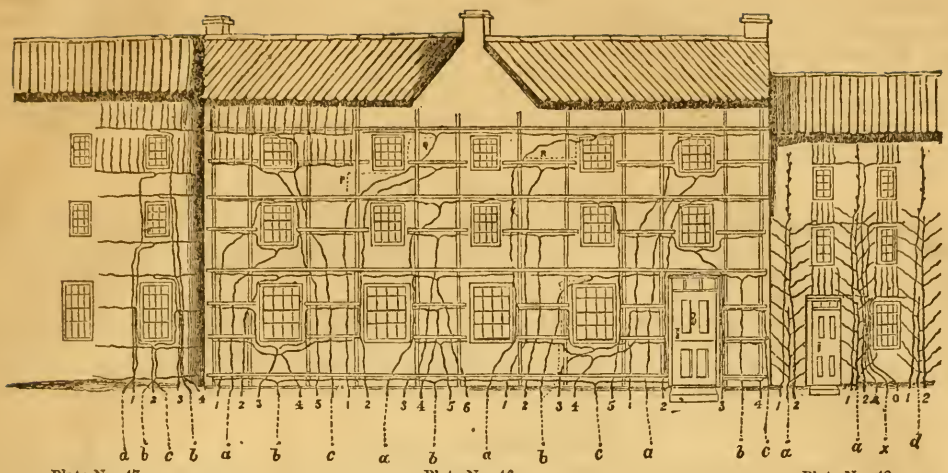


Plate No. 47. Plate No. 46. Plate No. 48.

The same house as represented in No. 45. Vines properly trained.

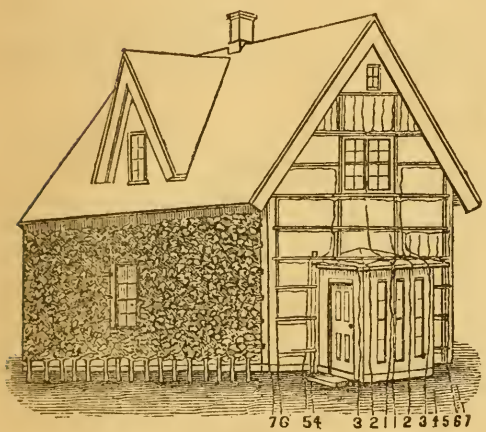


Plate No. 51.

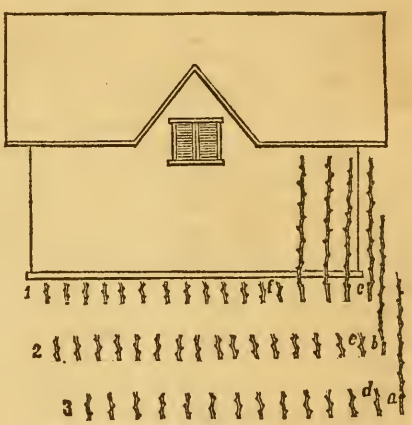


Plate No. 52.

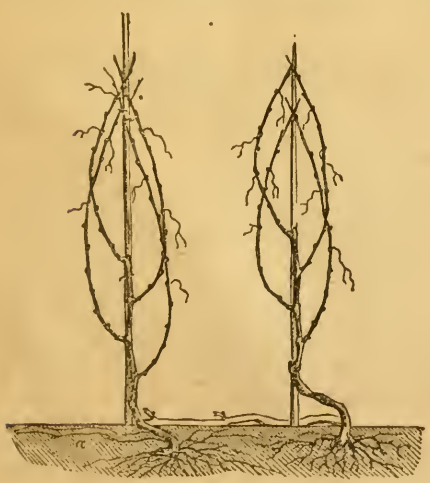


Plate No. 53. Plate No. 54.

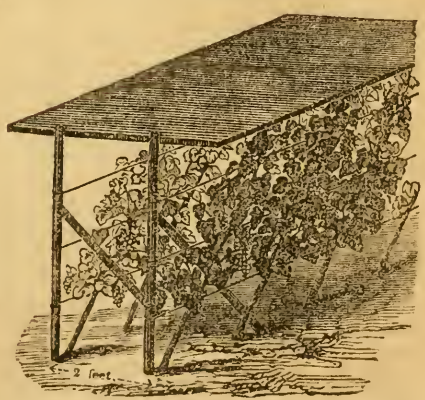


Plate No. 55.

IONA AND ISRAELLA VINES.

I OFFER for sale a fine stock of these vines, numbering not less than ten thousand plants, a considerable portion of which are already engaged. The plants are produced from single eyes, taken from wood grown expressly for the purpose of propagation, with all of the care possible to secure a hardy and enduring growth, and not one of them will fail to grow and give satisfaction, if treated according to the directions given in the Illustrated Catalogue, which are simple, with every process for their management, from the reception of the plant to full establishment in bearing, clearly and unmistakably shown by engravings. Price for strong and remarkably well-rooted plants, one year old, grown in open ground or pots, as may be preferred:

SINGLE, $2; PER DOZEN, $18; PER HUNDRED, $125.

The ordinary charge will be made for packing, which barely includes the cost. The vines may be sent in perfect safety in the fall to any part of the United States or Canada, and a receipt is taken from the Express Company, which secures from loss by transportation. Losses very rarely occur, and payment has never been refused for the loss of my packages, when the certificate of loss has been presented.

The price is put so low that buyers need not be restricted by cost to the purchase of single vines for the present, with the idea of purchasing by the dozen for family supply of the fruit when they become cheaper, for at the present price they only afford a fair return for the cost and care of production.

N. B.—A few plants of good quality, two years old, transplanted and root-pruned, both in pots and open ground, for Three Dollars each, or Thirty Dollars per dozen.

THE GREELEY PRIZES.

FOR the purpose of obtaining new varieties of our three leading Fruits, or of suitably designating one from each that may be possessed of all of the excellences that belong to the kind in an eminent decree, and above all others, Mr. Greeley offered three premiums of one hundred dollars each, one for grapes, one for apples, and one for pears. The following is an extract from the offer for Grapes:

The requirement, as will be seen by the extract below, is exceedingly high, being nothing less than for a grape of quality equal to the best European kinds, with a vine equalling in hardiness of leaf and constitution the most enduring of our native kinds, thus combining all of the good qualities of both, and avoiding the defects of each.

It will be seen that in the opinion af a Committee, as well qualified to judge as could have been selected, the *Iona* fully meets the requirements, and I believe all good judges who have had an opportunity to become well informed on the subject fully and heartily concur in their decision.

AWARD OF THE "GREELEY PRIZE."

The Hon. Horace Greeley having very generously offered a prize of one hundred dollars for a grape adapted to general cultivation in the Middle and Eastern States, the Committee, after due consideration, have awarded it to the "Iona," raised by Dr. Grant. The additional requirements were, in general terms, that the grape should be larger than the Delaware, early, tender to the center, high-flavored, sweet, spirited, and good for market and the table. These requirements are fully met by the Iona. So far as *trial* is concerned, the Iona is not a new grape, and the Committee failed to see that any thing would be gained by postponing the award, some of them being already quite familiar with the new grapes now before the public. More grapes as good, or even better, are wanted, and a prize equally valuable is in store for such. The Iona, during the past four or five years, has been grown in several parts of New-York, in Massachusetts, Connecticut, Pennsylvania, Delaware, New-Jersey, etc., and in all has proved to be early, a good and healthy grower, and of the best quality. Some of your Committee have seen it in a number of these places, and can confirm the favorable reports that have been made. Your chairman has had it some six years, and examined it under a variety of circumstances, and he fully concurs in the high opinion of his associates. In conclusion, the Committee are of opinion that the Iona is the only grape now before the public that meets the requirements of the "Greeley Prize," and they accordingly award it. All of which respectfully submitted. [A copy.]

NOTE TO PURCHASERS.—All of the large plants, except the Box Layers and those in Pots, before packing will be cut back to about five buds or eyes, which leaves the canes longer by two buds than they should be suffered to remain after they are planted.

The canes of the box layers will be cut to about two and a half feet, which is sufficient for any plan of management or training to which they may be subjected, except when it is desired to take the bearing arms from a great height, as is often the case for training on buildings, for which special plants are prepared.

TREATMENT OF VINES WHEN RECEIVED.—As soon as the vines are received, the boxes should be opened, and a careful examination of the condition of the plants made, and if the packing is found to have been insufficient and the vines are not in good order, notice should be immediately sent to me, stating the precise defect, and the vines carefully returned to the box and held subject to my order. (No such instance has yet occurred in the course of an extensive business of fourteen years.) The examination should be made where the vines will not be subjected to the action of the sun or wind, nor to more than a moderate degree of heat or cold. The roots should not be exposed so much as five minutes to the atmosphere, nor for one moment to the influence of a fire or stove, or to a temperature so low as forty degrees. The plants should not be exposed to the atmosphere longer than a person can conveniently hold his head under water. Before opening the box, the ground should be prepared for heeling them in, so that no exposure will occur. When plants are received for clubs, each member should be present with a basket or box, having in it enough fine soil to cover the roots immediately, to protect them while being taken to a place for heeling in, which should be done without delay. If the plants are received in good order, they will never fail to give satisfaction, if well treated according to directions given for planting, which should be carefully studied before the plants are received.

In the descriptive catalogue will be found examples of selections of vines, to guide purchasers in making choice of varieties for family supply, and also directions for keeping grapes in winter, with explanatory engravings. Grapes may be nearly as easily kept until the last of March as apples, by making choice of the proper varieties. Special instructions sent on application for those who wish to form clubs.